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THE PHILIPPINE
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D. ETHNOLOGY, ANTHROPOLOGY, AND
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III. FILIPINO TYPES: RACIAL ANATOMY IN TAYTAY.

B. THE WOMEN.

By ROBERT BENNETT BEAN, assisted by FEDERICO S. PLANTA.

(From the Anatomical Laboratory, Philippine Medical School, Manila, P. I.)

This is the third in a series of studies of Filipino types, the other two[1] of which and the first part[2] of the present study, "A. The men," have appeared in a previous issue of the JOURNAL.

Only 63 women were measured at Taytay and the data obtained may be consulted by referring to the table of "Actual measurements," page 17. The measurements were made at the same time and in the same manner as those of the men of Taytay, Mr. Planta doing the calculation and Doctor Bean writing the paper and making the deductions.

Casual observations lead to the conclusion that the women of Taytay are more Primitive than the men, and this may be corroborated or disproved by the present study.

THE BODY PARTS.

The comparison of the men and women of Taytay with the women of northeastern Siberia measured by Frau Jochelson Brodsky[3] will constitute a feature of the present work. The comparisons will be made by using single measurements, taking the stature first.

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[1] *This Journal, Sec. A* (1909), **4**, 263, 297.

[2] *Ibid*, 359.

[3] Zur Topographie des weiblichen Körpers Nordostsibirischer Völker. *Arch. f. Anthrop.* Neue Folge (1906), **5**, 158.

Stature.

Group.	Number of individuals.	Maximum.	Mean.	Minimum.
Taytay men	183	171	159	145.7
Taytay women	63	162.4	147.8	136.8
Siberian women	305	163	146.5 to 149.1	137

The women of Taytay are below medium stature, accepting Topinard's classification, and they are relatively smaller than the men. The Siberian women are almost identical in stature, even to the maximum and minimum, because the extremes of 63 Taytayans are practically the same as those of 305 Siberians.

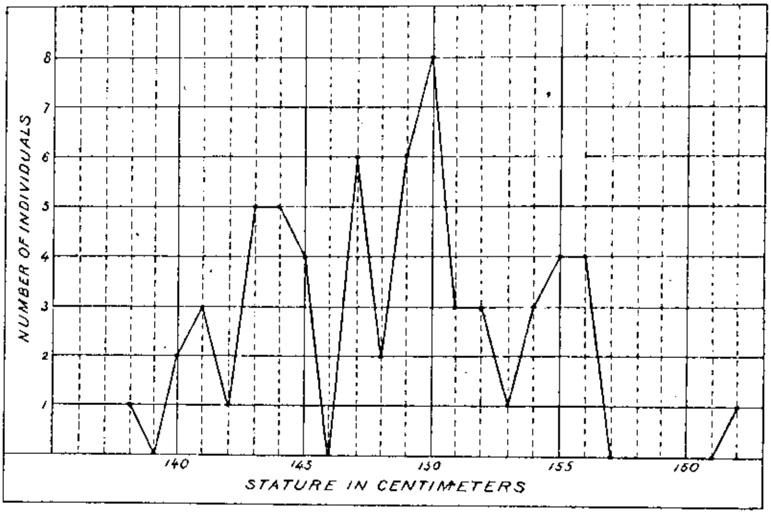

FIG. 1.

The curve of stature for the woman of Taytay is more irregular than that of any group of the Siberian women, indicating greater homogeneity for the latter, and a more complex composition for the Taytayans.

The stature is furthermore treated in groups by types as in former studies. The selection of types has been accomplished by the method adopted for previous groups of Filipinos, using the median stature of 153 centimeters for the women instead of 163 centimeters, which was used as the median for the men. In this way the following table is produced:

The stature of the types—women of Taytay.

Types.	Number of individuals.	Maximum.	Mean.	Minimum.
Primitive	2	142.1	141.2	140.3
Iberian	12	155.8	151.2	144
Australoid	7	149.5	144.4	136.8
Modified Primitive	2	149.3	149.2	149
Alpine	2	150.2	147.5	144.7
B. B. B	1		155.3	
Adriatic	1		155.8	
Blend	36	162.4	147.8	138

It is seen that the stature of all the types except the B. B. B. and Adriatic is below medium, and that of the Primitive is small. The Iberian is below medium height, whereas the Iberian of Europe is above medium height, and the student Iberian is taller than the European. This indicates that the women of Taytay are primitive in stature, even when the type is Iberian. The Australoid is intermediate in stature between the Primitive and the Iberian, although nearer the former than the latter.

The Blend has a greater extent of variability as indicated by the maximum and minimum, and the Primitive and Modified Primitive have the least variation of all. The Iberian has less distance between the extremes than the Australoid, although almost twice as numerous. The Iberian and Primitive are therefore to be considered more homogeneous than the other types and the Blend and Australoid not so homogeneous.

Sitting height.

Group.	Number of individuals.	Maximum.	Mean.	Minimum.
Taytay women	63	82.90	78.54	71.30
Taytay men	183	91.70	83.99	74.30
Jakuten (women)	64	83.70	78.12	72.50

The sitting height is compared first by the general average, and afterwards by types. The sitting height of the women is less than that of the men, and the variation of the two groups as indicated by the extremes is about in proportion to the number of individuals in each group. The sitting height of the women is greater than that of the men relatively to stature, and that of the Taytayan women is relatively greater than that of the Siberian.

The mean sitting height of the Taytay women is nearer the maximum than the minimum, which indicates that a larger number of the women have a sitting height near the maximum than near the minimum; and as the greater sitting height is supposed to represent the Primitive type, this is an indication that a greater number of the Taytay women partake of the Primitive type than of the Iberian or the other types. The mean sitting height of the Siberian women, on the other hand, is almost exactly intermediate between the extremes, indicating an even distribution of sitting heights about the mean, therefore more homogeneity.

The relatively greater length of body in the women of Taytay seems to be due to the predominance of the Primitive type among the Blends as indicated in the following tables:

Relative sitting height by type.

MEN OF TAYTAY.

Type.	Number.	Stature.	Relative sitting height.
Primitive	3	150.2	53.6
Modified Primitive	6	156.3	53.2
Australoid	32	157.7	53.7
Blend	92	158.8	52.9
Alpine	10	159.8	52.8
Iberian	17	160.8	52.8
B. B. B	2	165.4	53.1
Cro-Magnon	11	167.8	52.6

WOMEN OF TAYTAY.

Type.	Number.	Stature.	Relative sitting height.
Primitive	2	141.20	52.66
Australoid	7	144.40	52.59
Alpine	2	147.45	51.73
Blend	36	147.78	53.15
Modified primitive	2	149.15	53.30
Iberian	12	151.20	52.58
B. B. B	1	155.30	52.93
Adriatic	1	155.80	52.18

The sitting height in general is relatively less for the tall than for the small individuals.

Taken by type, the Blend, with less stature than some other types, has relatively greater sitting height, and this difference is greater in the females than in the males. The Primitive type, also with less stature than any other type, has a greater relative sitting height among the males than any other type except the Australoid, and among the females a greater relative sitting height than any other except the modified Primitive, Blend, and B. B. B. This indicates that the Australoid males and the modified Primitive, Blend, and B. B. B. females are influenced in relative sitting height by the Primitive, provided, of course, we accept the conclusions of the author, that the Primitive has a relatively long body and short legs. The Australoid type resembles the Primitive among females, and the Iberian among males, in both stature and relative sitting height, which may lead us to think that the primary inhabitants were Primitive and the secondary Iberian, provided again we accept the conclusions of the author that the Australoid is a product of the Iberian and Primitive with mosaic characteristics, especially the disharmonic physiognomy, and provided we also accept Pearson's law that males inherit more from the father, and females more from the mother.

Lower extremity.

Group.	Number.	Maximum.	Mean.	Minimum.	Relative to stature.	Stature.
Taytay men	183	95	83.08	72.8	52.10	159.47
Taytay women	63	84	76.80	69.6	51.96	147.8
Jakuten women	65	84	74.87	62.7	50.47	148.34

Turning now to the length of the lower extremity as expressed by the trochanter height, we find that the females are less than the males both in absolute measurements and in relation to stature. The latter is slight, however, and the males and females are practically identical. The Jakuten of Siberia have less trochanter height, relatively and absolutely, than the woman of Taytay. They have also less than the other Siberian women measured by the same author, but all the Siberian women are practically the same in these dimensions. The indication is that the women of Siberia have more Primitive elements than either the men or the women of Taytay, as represented by absolute and relative trochanter height, and the women of Taytay have more Primitive elements than the men, although this is a negligible fact. It may be of interest to note in this connection that the height of the pubis is, relatively to stature, 51.3 for the Taytay women, 49.4 for the Siberian women, and 52 for the Russian women measured by Teumin.

The trochanter height.

MEN OF TAYTAY.

Type.	Number.	Stature.	Relative trochanter height.
Primitive	3	150.2	50.8
Modified Primitive	6	156.3	51.2
Australoid	32	157.7	51.7
Blend	88	158.8	51.9
Iberian	17	160.8	52.4
Cro-Magnon	11	167.8	53.1

WOMEN OF TAYTAY.

Type.	Number.	Stature.	Relative trochanter height.
Primitive	2	141.2	51.6
Australoid	7	144.4	51.8
Alpine	2	147.4	52.8
Blend	36	147.8	51.5
Modified Primitive	2	149.2	51.6
Iberian	12	151.2	52.6
B. B. B	1	155.3	52.8
Adriatic	1	155.8	53.9

When the trochanter height of the types of the men of Taytay is contrasted with that of the women, it is noted that the relative trochanter height increases with increase of stature, but the Primitive, Modified Primitive, Australoid, and Blend of the women have a relative height about the same, with varying stature, and the Alpine, Iberian, B. B. B., and Adriatic also have a relative height about the same, but different from that of the other four types. The stature varies also, but is higher in the last four than in the first four, except the Alpine, which is less than the Modified Primitive and Blend.

Pfitzner[4] has demonstrated that the relative body length decreases with increase of stature in both male and female from a stature of 41 centimeters to that of 180, and the relative length of the extremities (arm and leg) increases with each increment of stature. This is corroborated by my findings, and it would appear that the greater relative leg length is no more than an additional increment of stature, or that stature and leg length are highly correlated. This is no doubt true, and as demonstrated by Martin and others the upper leg length and stature are more highly correlated than are other parts with the stature. However, the cause of the correlation is as yet, undefined. If it is a matter of stature, then additional stature causes additional and relatively longer limbs. If it is a matter of limb development, then the long extremities cause greater height, but not so great in proportion to the length of the extremities. If it is a matter of the interplay of factors in development, then the undeveloped have small stature and relatively less limb length and the fully developed, or overdeveloped, have tall stature and relatively greater limb length. This is probably the true cause, and not only is it true in the development of the individual, but also in the development of the species. The Primitive and its related types are early species of man, and the form is retained more largely in women at present, with small stature, relatively long body and relatively short extremities; whereas the Iberian and its related types are more recent species of men and have the form retained more largely in men, with tall stature, relatively short body and relatively long extremities.

UPPER EXTREMITY.

The length of the upper extremity as represented by the distance from the acromion process to the finger tip may be considered in this connection.

Group.	Relative length of the upper extremity.	Number of individuals.
Men of Taytay	45.8	180
Women of Taytay	45.0	63
Women of Siberia	44.5	113

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[4] Pfitzner, W. Social-Anthropologische Studien. IV. Die Proportionen des erwachsenen Menschen. *Ztschr. f. Morphol. u. Anthrop.* (1903), 5, 201-314.

Men have relatively longer arms than women, and the Taytayans have relatively longer arms than the Siberians. The first statement is confirmed by Frau Jockelson-Brodsky, who assembles the records of measurements made by 33 different investigators of related Siberian peoples, and in only one group does the relative arm length of the women exceed that of the men, and in only five groups does it exceed 54.0, in the Lapps, the Ainos, the Jakuten, the Kirgisen and Sojotinnen, and in each group the relative length is less than that of the men of Taytay. There is so little difference, however, that no conclusions may be drawn with safety. There is apparent correlation of stature and arm length, as there is of stature and leg length.

TROCHANTER HEIGHT AND PUBIS HEIGHT.

The difference between the height of the pubis and the trochanter is greater in the men of Taytay (difference 1.3 centimeters) than in the women (difference 1.0 centimeter), whereas the two points in the Siberian women are practically identical. There would seem to be a sexual difference, a higher trochanter in men, or a lower in women, or a higher pubis in women and a lower in men, although a greater amount of material should be utilized before this can be definitely decided.

The omphalic index.

Group.	Number.	Maximum.	Mean.	Minimum.	Author.
Men of Taytay	180	60.26	42.35	20.36	Bean.
Women of Taytay	63	73.20	48.20	32.30	Do.
Jakuten (women)	64		42		Jochelson Brodsky.
Russian women and Russian Jewesses			33		Teumin.

The navel of the men is lower than that of the women, which has been demonstrated already for the Igorots and Morgue subjects; the navel of the women of Siberia is at about the same relative position as that of the men of Taytay. Siberian men are not to be compared with the Siberian women, but no doubt if such a comparison could be made the men would be found to have lower navels than the women. The Jewish and Russian women have lower navels than any other group under consideration. This is of interest when the omphalic index is considered in relation to type as follows:

The omphalic index.

MEN OF TAYTAY.

Type.	Number.	Omphalic Index.		
		Maximum.	Mean.	Minimum.
Primitive	3	56.5	44.1	37.0
Australoid	32	55.9	41.4	26.2
Iberian	15	52.8	42.9	33.5
Cro-Magnon	11	51.6	42.9	38.6
Alpine	10	52.2	42.6	36.3
Blend	88	57.6	42.2	20.4
Modified Primitive	6	46.2	43.1	35.2

The omphalic index—Continued.

WOMEN OF TAYTAY.

Type.	Number.	Omphalic index.		
		Maximum.	Mean.	Minimum.
Primitive	2	47.7	47.6	47.5
Australoid	7	63.6	48.4	36.8
Iberian	12	54.6	46.4	38.4
Alpine	2	45.4	39.2	33
Adriatic	1		38.8	
B. B. B	1		37.6	
Blend	36	73.2	49.9	32.3
Modified Primitive	2	47.8	46.2	44.6

Among the men the Primitive and Modified Primitive types have a higher omphalic index than the others and the Australoid has the lowest of all. Among the women the Australoid, the Blend and Primitive types have the highest indices, and the Alpine, Adriatic, and B. B. B. have the lowest; but only four individuals of the latter types were observed. The significant facts are that the Iberian and its related types have a lower index than the Primitive and its related types in both men and women, with slight exceptions. The Blend among the men has a low (42.2) and the Blend among the women a high index (49.9) which indicates that the female Blend is more largely Primitive and the male Blend more largely Iberian in omphalic index. It is to be supposed from the above that the women of Europe, particularly the Russian and Jewish women, are largely Iberian and the Siberian women are largely Primitive.

The omphalic index of the Igorot women and of the women measured in Malecon morgue is greater than that of the men of these groups, and the omphalic index of the Igorot boys is also greater than that of the men, all of which indicates that women are more Primitive than men in this respect.

RELATIVE UPPER-ARM LENGTH.

In the previous study of the men of Taytay it was noted that the relative upper-arm length, the brachial index and the crural index were factors that differentiated the Taytayan from other groups such as the Soudanese Negroes, the European, etc.; therefore it may be well to examine these factors in the women of Taytay.

The relative upper-arm length of the men of Taytay is greater than that of any other people except the Sikh, Chinese, and European, and since this factor is the same for the women of Taytay it may be dismissed. There is also little difference between the types in this factor, so that its varieties have relatively shorter upper arms than the Iberian and its varieties, following in this the relative length of the upper leg. This may be significant as a differential factor of the types, or only incidental to stature, the types with small stature having relatively short upper arms and legs, and the types with medium or tall stature having relatively long upper arms and legs. The brachial and crural indices may throw some light on these conditions.

BRACHIAL INDEX (RADIO-HUMERAL).

The brachial index of the women of Taytay is 70.1, a little less than that of the men. It is also less than that of the Russian women measured by Teumin, 72.4, the Siberian women measured by Jochelson-Brodsky, 75.0, the Aino women of Koganei, 79.4, and the Japanese of Bälz, 80.5 to 89. The same index is 75.6 for the Igorot women. When this is examined for the types, the results are somewhat discordant; although the Primitive and related forms have a higher index than the Iberian they are practically the same, and the low index of the Australoid may be attributed to Iberian influence. The male Blend, which has heretofore seemed to have more Iberian or fewer Primitive elements than the female Blend, in this instance seems to have more Primitive elements or fewer Iberian elements. However, the Primitive, Modified Primitive, and Blend have higher indices than the Iberian, Cro-Magnon, and Australoid, which indicates that the Primitive brachial index is higher than the Iberian.

The brachial index.

Type.	Number.	Men.	Number.	Women.
Primitive	3	73.7	2	74.4
Australoid	33	70.4	6	66.2
Iberian	15	70.8	11	68.8
Cro-Magnon	11	72.5		
Alpine	10	68.9	2	72.8
Blend	87	79.8	36	72.2
Modified Primitive			2	70.2

If this applies to the Russians, Siberians, and Japanese, then, without doubt, the Primitive elements increase as the Orient is approached through those three peoples, certainly among the women. The Taytay women in brachial index appear to have more Iberian elements and fewer Primitive than any of the three.

Hamy[5] gives the brachial index of infants and children as 88.88 for those aged 2 months, and 72.30 for those aged 5 to 13.5 years, which would indicate that the Primitive is more infantile than the Iberian, because the brachial index of the Primitive is higher than that of the Iberian.

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[5] Hamy, E. T. Recherches sur les proportions du bras et de l'avant bras aux differents ages de la vie. *Bull. Soc. Anthrop. Paris, deuxieme serie* (1872), 7, 495–513.

The brachial index of the Taytay women exhibits marked individual variation by reason of the great shortening of the humerus in not a few individuals. Three women were seen in Taytay, one in the neighboring barrio of Rosario, and two in the town of Pasig, about 1 kilometer distant, who had upper arms not more than 10 or 12 centimeters in length, and forearms of the usual length. Unfortunately none of these women could be measured, therefore no record may be made of their brachial index. It is probably a pathologic condition due to defective nutrition or disease, and not a type, although congenital or hereditary predisposing causes can not be excluded.

THE CRURAL INDEX (TIBIO-FEMORAL).

The index of the women of Taytay is 5 less than that of the men (95.1 and 90.1), but in no way can this be compared with the index of the women of Siberia, because of differences in measurement and computation. Considered from the standpoint of type, however, the following differences are determined:

The crural index.

Type.	Number.	Men.	Number.	Women.
Primitive	3	92.7	2	92.7
Australoid	33	97.3	7	94.5
Iberian	15	94.2	12	88.6
Cro-Magnon	11	93.4		
Alpine	10	96.0	2	88.3
Blend	87	95.1	35	91.1
Modified Primitive	7	97.9	2	89.7

The evidence from this table is that the Primitive has a smaller index than the other types except the Iberian and Alpine women, but so few as five individuals do not constitute a fair number for an average. The Modified Primitive of the men has the highest index of all, but the index of the women is low; since here again only two individuals were measured, this may be disregarded. The crural index of the Primitive Morgue subjects was calculated to be more than 100, although only 7 men and 3 women were measured. It would be advisable to measure a greater number of the Primitive type before the crural index can be determined absolutely.

There can be no doubt but that the Australoid type has a high crural index, because enough individuals have been measured to indicate this, and all the measurements are corroborative. This would make the Australoid like the Negro and Negrito. The Iberian, on the other hand, has a lower index, the Cro-Magnon and Alpine as well. The Blend, too, has a low index which denotes greater Iberian and Primitive(?) influence than Australoid.

The crural index of the women in each type except the Primitive is less than that of the men, which means that the women have relatively shorter lower legs than the men. They are thus more Primitive, provided the Primitive is found to have a relatively low index.

To summarize the measurements of the body parts:

The stature of the women of Taytay is small, identical with that of the Siberian women, although more variable, and relatively less than the stature of the men of Taytay. The sitting height of the women of Taytay is practically the same absolutely and in relation to stature as that of the Siberian women, although the relative sitting height is greater than that of the Siberian women or of the men of Taytay.

The leg length of the women of Taytay is absolutely and relatively greater than that of the Siberian women and less than that of the men of Taytay. Leg length is highly correlated with stature, and this may be due either to onotogeny or phylogeny, or to both.

The arm length is similar to the leg length in its various relationships.

The pubis of woman is probably lower than that of man.

The omphalic index of woman is higher than that of man, and the omphalic index of the Siberian women is intermediate between that of the women of Taytay and the women of Europe, and it is exactly the same as that of the men of Taytay. The women of Europe have a very low index and the women of Taytay have a very high one.

The brachial index of the women of Taytay is a little less than that of the men, which is less than that of the Russian women.

The crural index increases in women as follows:

Taytayan	70.1
European	72.4
Siberian	75.0
Aino	79.4
Japanese	80.5–89.0

The crural index of the women is less than that of the men.

From the standpoint of type the greatest differences appear between the Primitive and the Iberian, and in practically all the measurements the women are more Primitive than the men, and the men are more Iberian than the women. The Australoid type is intermediate between the Iberian and Primitive, except in brachial index, in which it is almost exactly the same as the Iberian and the crural index, in which it is like neither, but resembles the Negrito.

THE HEAD AND FACE.

The body parts having been discussed, attention may now be devoted to the head and face. A comparison of the most important indices will be made.

Cephalic index.

Group.	Number.	Maximum.	Mean.	Minimum.
Men of Taytay	182	94.3	81.8	72.0
Women of Taytay	63	95.6	82.9	73.8
Jakuten (women)	57	90.0	83.3	74.0

The cephalic index is greater for the women than for the men, and the Siberian women (Jakuten) have the same index as the women of Taytay, although this group of Siberian women, the Jakuten, has a higher cephalic index than the other groups of Siberians given by Frau Jochelson-Brodsky. In this, as in the stature and other measurements, the Jakuten and the women of Taytay are alike.

The cephalic index of the types is distinctive because it is used as a differential factor in conjunction with the stature and nasal index in the segregation of types; therefore it may be presented without comment.

The cephalic index.

Type.	Number.	Index.	Number.	Index.
Primitive	3	88.5	2	86.3
Iberian	15	76.2	12	77.9
Australoid	35	78.0	7	78.3
Alpine	11	87.7	2	92.9
B. B. B	2	82.8	1	85.5
Cro-Magnon	12	78.3		
Blend	91	83.3	36	84.2

Nasal index.

Group.	Number.	Maximum.	Mean.	Minimum.
Men of Taytay	182	110.0	85.2	54.9
Women of Taytay	63	114.7	86.0	68.1
Jakuten (women)	30	78.0	64.6	55.0

The women of Taytay have wider noses than the men, and a great deal wider than those of the Siberian women (Jakuten), which may be due to the fact that Frau Jochelson-Brodsky used the nasion and I used the line of greatest depression of the nose bridge as the point from which to measure the nose length. A difference of 8 to 10 points less is obtained by using the nasion instead of the line of greatest depression, and this may account for some of the difference between the two groups of women; but after all deductions are made, there remains a considerable distinction, and the nose of the women of Taytay is wider than that of the Siberians. The nasal index by type is presented without comment for the same reason that the cephalic index was so presented.

The nasal index.

Type.	Men of Taytay.		Women of Taytay.	
	Number.	Index.	Number.	Index.
Primitive	3	89.1	2	107.4
Iberian	15	78.5	12	77.4
Australoid	35	93.3	7	97.4
Alpine	11	70.1	2	82.0
B. B. B	2	67.6	1	66.0
Cro-Magnon	12	93.4		
Blend	91	83.8	36	85.2

The face index (morphologic).

Group.	Number.	Maximum.	Mean.	Minimum.
Men of Taytay	178	93.3	81.3	66.1
Women of Taytay	61	90.4	79.1	66.9
Jakuten (women)	38	95.0	84.0	76.0

The face of the women of Taytay is relatively broader than that of the men, and both are broader than the face of the Siberian women. It is to be noted in all the head and face indices that there is a greater range of variation, judging from the extremes, in the women of Taytay than in the Siberian women.

In the consideration of face index and type a combined face index is utilized because this is a better differentiation than either the morphologic or physiologic face index alone. The combined face index is obtained by dividing the morphologic by the physiognomic (combined face index $=\frac{\text{morphologic face index}}{\text{physiognomic face index}}$). The following table is the result:

The combined face index—women of Taytay.

Type.	Number.	Maximum.	Mean.	Minimum.
Primitive	2	86.3	83.3	80.3
Iberian	12	143.9	117.8	99.8
Australoid	7	127.8	113.8	95.2
Alpine	2	117.8	114.3	110.8
B. B. B	1	----------	88.0	----------
Modified Primitive	2	96.4	91.7	87.1
Blends	34	139.1	108.8	87.8
Adriatic	1	----------	113.7	----------

A high combined face index means a relatively long and narrow face, whereas a low combined one means a relatively short and broad face.

The Primitive and the Iberian are more distantly separated in this particular than any of the other types, and the Blends are nearer the Iberian than the Primitive. The Australoid and the Alpine also resemble the Iberian in this respect. The Modified Primitive is more like the Primitive.

To summarize the head, nose and face:

The cephalic index, nasal index, morphologic face index, and combined face index demonstrate that the women of Taytay have relatively broader heads, faces and noses than the men of Taytay, and the latter have the same characters relatively broader than the Siberian women, except that the cephalic index of the men of Taytay is slightly less than that of the others. The broad head, face and nose characterize the Primitive type, which would indicate that the women of Taytay are more Primitive than the men, or than the Siberian women.

THE EAR FORM.

The ears of the women of Taytay are not definite in type, but more mixed than those of the men. Unlike the other physical characteristics which are so largely Primitive in nature, the ears of the women are more largely Iberian, 52 of the 63 having Iberian characteristics pure or mixed, whereas only 8 have Primitive. There are also 14 that partake of the B. B. B. type, entirely or in part. No other forms appear to any considerable extent, although 16 are noted as mixed, which means that the type is not pure. The inference is that the ears of the women of Taytay are impure Iberian, partaking therefore of the Australoid, with Primitive markings.

When the "Type of individuals" in the fifth column from the right side of Table II, page 20, is corrected by the use of the ear type as a factor, and removing from the Blend those individuals resembling the Iberian or the Primitive, the following changes occur, as represented by the "Species of individuals" in the first column of the same table: Eight Blends become Iberian, six Blends become Primitive, and one Blend becomes an Australoid by its similarity to the latter type. Twenty-one Blends remain Blends. It is to be noted that the Blends that become Iberian are more like the Primitive than are those becoming Primitive like the Iberian; and as the Blends which remain are also more like Primitive than the Iberian, this is additional evidence that the Blends partake more of the former than of the latter in characteristics.

In this connection refer to Plate I where the Iberian (D) on the left may be compared and contrasted with the two Primitive (Blends). This may also be done more in detail by reference to Plates II, III, and IV, where both front and profile views may be seen. There can be no mistaking the Iberian characteristics of the woman in Plate IV. The long, narrow head and face, the long nose, the long ears with pendant lobule, everted concha, and helix that is rolled out below, are morphognomonic (a new word similar to pathognomonic and having the same meaning in relation to pathological conditions). Likewise, the two young women are unmistakably Modified Primitive in type, with shorter, broader heads, faces, noses, and ears, the last with somewhat depressed concha and lower helix turned forward. The same is true also of the Primitive (Blend) of Plate VI.

There are only two other plates, which will be described at this time to complete their consideration.

The modified B. B. B. of Plate V is a fair representative of this type as ordinarily seem among Filipinos, although it is by no means the pure B. B. B. as found among Europeans. However, the head and face are somewhat oblong and the ear is faintly so. The photograph does not show the ear to advantage; it is somewhat more oblong in shape than it appears. Plate I shows the figure on the right representing a woman who is square-set and solidly built, in contrast to the slender Iberian at the opposite end of the plate and the rounded lines of the other figures. There can be no doubt that these three types, the Iberian, the Primitive, and the B. B. B., exist among the women at Taytay, and the Australoid is also found, although no Australoid or Primitive of pure type could be photographed.

The dwarf of Plate VII is of a Modified Primitive type but by no means a pure Primitive. She is about 125 centimeters in height, very shy, childlike and simple-minded, and could not be prevailed upon to submit to any sort of measurements.

Disease and species.

Group.	Tuberculosis.	Tumors.	Other afflictions.	Number.
Iberian	3	4	3	20
Primitive	0	0	2	10
Blend	1	3	2	21
Australoid	1	0	0	8

The number of diseased persons is so small that a fair comparison is impossible, but the data corroborate previous findings; therefore they may be taken as substantiating former deductions. Fifty per cent of the Iberians examined were diseased, whereas only 20 per cent of the Primitive and about 30 per cent of the Blend were diseased. Fifteen per cent of the Iberians had tuberculosis, whereas none of the Primitives were so affected, and only one Blend and one Australoid had the disease. Two of the Iberians suffered with beriberi, which indicates that the Iberian is not immune to beriberi.

It is obvious from the above that the Iberian women of Taytay are more diseased than the Primitive, and they seem to be especially liable to tuberculosis.

In conclusion it may be said that the morphology of the women of Taytay is more Primitive than that of the men and resembles the women of Siberia. The types of ears and the physical types are as definite among the women as among the men, and are thereby more firmly established as entities. The Blend is largely Primitive in character and the Australoid is between the Iberian and the Primitive.

TABLE I.—*Actual measurements, in*

Serial No.	Clinical No.	Age.	Body.														Head.		
																	Maximum.		
			Stature.	Sitting height.	Pubic height.	Umbilical height.	Sternal height.	Chin height.	Ear height.	Ankle height.	Knee height.	Trochanter height.	Finger-tip height.	Wrist height.	Elbow height.	Acromion height.	Length.	Breadth.	Height.
1	428	45	140.5	76.9	69.5	82.6	113.4	118.3	127.3	5.3	40.8	69.6	52.6	68.0	85.0	114.0	19.1	14.1	12.6
2	407	18	150.5	77.3	76.3	94.0	122.0	128.5	138.0	6.1	43.5	79.0	54.0	71.0	93.2	121.0	16.6	14.8	12.1
3	393	40	147.0	81.8	73.5?	89.8	118.7	123.6	133.6	5.1	36.5	75.0	53.0	70.7	89.7	120.0	17.5	15.2	12.0
4	429	80	150.8	80.1	75.4	92.5	120.6	127.2	137.3	5.0	38.2	77.8	52.3	68.0	90.2	123.0	17.6	15.3	12.9
5	427	40	145.1	77.3	75.0	92.5	119.0	123.4?	133.0	5.3	38.6	75.2	54.2	70.6	91.0	121.4	17.9	13.8	12.0
6	468	45	149.4	78.1	77.8	91.0	120.5	128.0	137.4	5.6	41.3	78.2	58.0	74.8	94.4	124.6	18.2	14.3	11.6
7	445	27	141.4	75.7	74.7	85.2	116.0	122.0	130.4	6.1	36.5	73.0	53.4	69.4	88.0	116.4	17.2	14.5	11.6
8	443	37	143.0	78.7	70.5	84.0	114.8	119.8	130.7	5.5	36.0	71.2	53.8	70.0	89.0	116.5	18.1	14.9	12.3
9	444	20	142.1	75.5	73.0	86.4	114.6	121.4	130.5	4.9	38.2	74.0	49.5	65.8	86.7	115.2	16.3	14.2	-----
10	-----	49	142.7	77.5	70.6	84.5	113.4	119.4	130.0	4.8	38.7	72.3	50.6	67.0	84.8	115.3	17.2	14.5	11.7
11	460	50	146.6	78.7	77.7	90.5	117.2	124.8	134.2	5.4	38.2	76.5	54.5	70.8	91.5	119.7	17.7	14.6	11.0
12	-----	50	146.5	76.1	75.6	88.0	118.4	126.2	133.5	6.0	37.3	76.5	51.8	67.2	89.0	119.5	18.1	14.4	11.3
13	468	50	149.3	80.3	79.2	92.4	122.0	129.2	137.8	6.1	39.8	77.0	56.0	71.5	92.0	122.7	16.9	14.3	11.4
14	499	50	150.2	77.2	80.8	93.2	120.5	127.0	136.0	6.2	40.0	78.2	58.0	73.4	94.3	126.0	16.9	15.3	11.2
15	-----	45	149.2	82.5	74.5	92.0	119.2	126.3	135.5	6.0	58.5	75.0	57.0	72.2	93.5	121.5	17.1	15.0	12.0
16	262	25	149.0	78.7	77.0	91.3	121.2	128.3	137.2	5.8	39.3	77.0	57.2	72.8	94.4	123.6	15.8	15.1	11.6
17	498	31	150.3	80.3	72.0	92.8	121.2	128.7	136.2	5.9	42.5	74.0	56.8	70.8	93.8	124.0	18.0	14.3	12.3
18	-----	30	143.8	78.8	73.5	89.4	115.5	123.5	131.0	5.5	35.6	73.4	50.0	67.8	87.0	117.5	16.3	14.0	11.8
19	507	60	149.7	80.7	76.6	88.0	120.2	127.0	137.3	5.0	39.3	78.8	55.8	71.5	95.0	124.5	17.5	14.6	12.0
20	433	60	155.3	82.2	79.8	92.2	125.2	132.0	141.3	6.5	40.5	82.0	59.3	76.8	95.9	127.2	17.2	14.7	12.0
21	512	50	155.3	79.1	80.8	95.6	125.5	130.8	140.0	6.0	42.2	82.7	55.6	72.8	95.8	126.0	18.4	14.3	12.5
22	-----	20	155.8	81.3	82.8	95.5	128.2	133.6	144.2	5.8	40.0	84.0	58.0	74.3	95.6	129.3	17.7	15.4	12.2
23	506	36	149.5	81.1	74.8	88.0	118.7	127.2	135.7	5.0	38.5	76.5	50.5	66.8	87.3	121.8	17.6	14.1	12.4
24	213	80	156.0	81.5	80.4	91.6	126.2	132.5	142.0	6.2	40.2	81.1	54.8	71.4	94.5	126.5	18.5	14.9	12.3
25	524	24	154.0	-----	78.4	98.5	125.6	133.0	141.3	5.8	42.8	79.6	62.0	78.0	99.0	129.0	18.0	14.0	12.7
26	2	50	153.8	79.4	81.2	97.5	124.7	131.0	140.5	6.1	44.0	82.0	56.6	74.0	95.0	127.5	17.1	13.9	11.6
27	221	37	155.3	81.3	77.5	92.7	123.3	131.4	140.5	5.5	40.4	82.3	58.5	72.6	96.0	127.2	18.9	14.9	12.3
28	253	43	151.8	80.1	78.0	94.7	124.3	129.8	140.4	5.6	38.0	78.5	61.0	78.6	100.0	128.0	18.1	14.3	12.6
29	-----	22	150.3	79.2	75.8	90.5	121.0	127.0	137.0	6.2	38.4	78.7	53.2	70.4	92.3	123.0	18.2	14.1	12.5
30	572	34	144.1	75.5	75.6	87.2	116.8	123.0	132.0	5.8	42.4	77.4	54.4	70.2	89.6	118.0	18.3	14.4	11.5
31	578	30	143.7	79.5	70.2	84.2	116.5	123.4	131.3	5.3	35.4	70.7	50.8	66.8	86.8	117.8	16.8	14.0	12.0
32	645	39	144.0	78.9	71.4	87.5	117.0	122.5	132.6	4.7	36.7	71.3	53.4	69.7	88.8	116.4	18.7	14.7	12.0
33	677	50	162.4	81.2	79.2	90.5	123.7	131.0	140.5	5.7	39.5	78.7	55.4	72.2	93.0	123.5	16.6	14.9	12.3
34	652	23	155.6	81.3	82.4	94.0	125.5	133.2	141.5	6.3	39.5	79.8	56.0	73.0	94.4	126.7	17.8	14.8	12.6
35	664	50	146.8	79.7	71.0	87.5	118.0	124.7	134.2	5.8	37.7	72.3	53.5	69.0	90.0	120.5	16.8	14.7	12.4
36	699	50	148.3	77.9	73.8	87.8	117.0	123.0	133.5	6.4	39.0	78.0	55.0	72.0	90.5	119.7	17.9	14.5	13.0
37	70	45	151.3	80.3	78.6	93.0	121.5	127.3	137.3	5.5	40.0	80.0	55.0	72.4	93.0	123.0	18.8	14.3	12.2
38	690	60	145.4	79.7	72.6	84.6	115.8	123.7	133.0	4.9	37.0	73.5	53.4	69.2	88.7	-----	17.5	13.8	12.3
39	-----	48	144.7	75.3	75.0	85.3	116.5	124.0	133.3	5.5	39.3	77.6	47.0	64.3	88.2	118.0	16.8	16.0	12.5
40	698	50	149.3	79.8	75.5	88.5	118.0	129.5	137.3	5.8	40.5	77.8	55.0	71.5	94.0	123.2	18.0	14.1	11.8

centimeters—the women of Taytay.

Head.																					
Forehead width.	Bizygomatic diameter.	Bimastoid diameter.	Bigoniac diameter.	Naso-buccal.	Naso-alveolar.	Nose-base.	Nasion hair-line.	Chin-nasion.	Nose width.	Nose length.	Mouth width.	Mouth length.	Ear width.	Ear length.	Ear cartilage.	Interocular distance.	Eye length.	Eye color.	Frontal circumference.	Parietal circumference.	Forehead circumference.	Occipital circumference.
10.3	13.0	12.6	10.6	6.7	5.6	2.1	8.0	10.2	4.5	4.2	1.1	4.8	3.0	6.4	4.6	3.1	3.10	7	29.5	36.4	26.0	31.0
10.0	13.6	12.6	10.6	6.3	6.1	2.2	7.6	9.6	3.6	4.0	1.5	4.3	3.6	6.0	4.9	3.3	2.95	2	29.8	33.8	26.8	26.0
10.6	13.6	11.6	10.6	6.8	6.0	2.8	7.0	10.0	4.0	4.8	1.3	4.8	3.6	5.9	4.8	3.7	3.10	2–3	29.1	36.7	27.2	28.0
10.6	13.5	12.1	10.6	6.8	6.4	2.5	7.0	10.5	3.8	4.2	2.0	4.4	3.7	6.0	4.4	3.4	3.15	3	33.0	37.2	26.6	27.8
9.8	12.7	11.6	10.0	6.7	5.8	2.4	8.2	10.4	4.3	4.2	1.3	4.6	3.4	6.0	4.8	3.1	3.00	4	28.0	34.2	25.0	29.0
10.6	13.0	12.1	10.0	6.9	6.0	2.2	6.9	11.0	3.9	4.5	1.5	4.4	3.7	6.5	5.0	3.4	3.15	4	29.9	34.7	27.6	28.0
10.7	12.9	12.0	9.8	6.4	6.2	2.2	7.4	10.0	3.6	4.2	1.2	4.4	2.9	5.8	4.8	3.4	2.95	3	28.8	32.6	26.7	28.0
10.2	13.0	12.0	10.2	7.4	7.0	2.5	8.4	11.7	3.6	4.8	2.1	4.0	3.2	6.3	4.7	3.1	2.90	3	31.9	37.0	28.0	28.4
10.9	13.0	-----	10.0	5.7	5.2	2.6	6.9	8.7	3.9	3.4	1.8	4.6	----	----	----	3.4	2.95	----	----	----	----	----
10.3	13.1	12.0	9.6	7.0	6.1	2.6	7.9	10.4	3.7	4.8	1.8	4.4	3.8	6.1	4.7	3.4	3.00	2	30.4	36.4	26.7	27.5
10.3	12.7	12.1	9.5	7.0	6.0	2.3	7.6	11.0	3.9	4.8	1.6	4.1	3.4	6.3	4.9	3.3	2.35	4	28.6	34.0	25.2	27.8
10.1	12.5	12.1	10.1	6.1	5.6	2.5	9.6	9.3	3.5	4.6	1.4	4.3	3.5	6.7	5.2	3.0	2.85	3	28.0	35.9	25.8	28.3
9.4	13.3	12.4	10.2	5.8	5.4	2.4	7.9	9.7	4.4	4.4	1.7	4.5	3.3	6.3	4.9	3.5	2.70	3	27.5	34.8	25.5	27.5
10.4	13.7	13.0	10.4	7.6	6.8	2.6	8.4	10.8	4.2	5.0	1.8	4.6	3.5	6.3	4.8	3.5	2.80	2	28.6	36.0	26.7	27.8
10.8	13.8	12.2	10.3	6.8	6.0	2.5	----	-----	3.7	4.6	1.4	5.0	3.5	6.3	4.7	3.5	3.00	1	30.3	36.2	28.2	26.0
10.8	13.7	12.1	10.1	6.0	5.4	2.5	8.0	9.4	3.5	3.8	1.3	4.5	3.4	5.6	4.5	3.4	2.95	3	29.3	35.7	27.3	24.8
10.0	13.2	12.2	10.0	6.6	6.4	2.1	8.5	10.8	3.7	4.4	1.9	4.3	3.4	6.3	5.0	3.1	3.20	1	30.0	36.0	26.5	28.0
9.8	12.8	11.4	9.8	6.0	5.4	2.2	7.3	9.4	3.7	3.9	1.8	4.5	3.5	6.0	4.8	2.9	3.05	3	27.6	34.0	25.3	24.2
9.8	12.8	11.9	9.7	7.1	5.6	2.1	8.0	10.6	4.0	4.5	2.0	4.2	3.5	7.8	5.2	3.3	2.95	4	28.3	36.1	26.1	28.2
11.0	14.1	13.7	10.5	7.3	6.3	2.7	7.5	10.0	3.3	5.0	1.0	4.5	3.7	7.1	5.5	3.3	2.65	4	28.7	33.6	26.4	28.3
10.5	13.6	12.7	10.5	6.6	5.3	2.9	8.8	10.9	3.7	4.8	1.6	4.0	3.5	7.0	5.1	3.7	7.95	4	30.3	36.8	28.7	27.0
10.5	13.4	12.7	10.0	6.2	6.0	2.5	7.6	11.0	4.0	3.8	2.5	4.8	3.6	5.7	4.7	3.7	2.90	3	-----	-----	-----	-----
10.4	13.4	12.2	10.4	6.3	5.7	2.4	7.1	10.0	4.3	4.4	1.5	5.1	3.2	7.0	4.7	3.4	2.95	----	30.0	35.7	27.0	28.4
10.3	13.6	12.5	10.0	7.4	6.8	3.0	6.7	11.6	4.0	5.2	2.0	4.5	4.2	7.0	5.6	3.0	3.00	----	29.0	36.0	28.6	29.0
10.7	13.3	12.0	10.1	6.2	5.8	2.1	8.7	10.0	3.5	4.3	1.7	4.3	3.6	6.0	4.7	3.3	3.00	2	29.3	33.4	28.0	27.6
9.8	13.0	11.6	9.6	6.7	6.3	2.5	7.8	10.4	3.5	4.5	1.5	4.2	3.4	6.4	4.8	3.2	2.60	2	29.5	34.2	26.6	25.1
10.8	12.9	12.0	9.7	6.9	6.4	2.6	8.8	11.1	3.7	4.9	2.1	4.3	3.5	6.2	5.1	3.5	2.80	3	30.7	36.8	27.3	29.2
10.2	13.5	12.4	10.2	7.1	6.8	2.2	8.8	10.6	3.9	4.6	1.7	5.0	3.7	6.9	5.3	3.5	2.75	3	30.0	35.4	29.0	26.5
10.6	12.6	11.5	10.2	6.6	6.1	2.5	8.0	10.5	3.6	4.2	2.3	4.5	3.4	5.7	4.5	3.4	2.80	3	30.7	35.0	28.0	25.5
10.0	12.0	11.1	9.6	6.2	5.9	2.2	8.2	9.7	3.2	4.7	1.0	4.5	3.2	5.7	4.4	3.1	2.70	4–5	28.4	36.0	26.0	28.4
10.0	13.0	11.8	9.5	6.2	5.7	2.5	8.0	10.1	3.4	4.1	1.5	3.9	3.0	6.0	4.1	3.4	2.90	----	28.0	34.0	26.8	25.3
9.8	12.8	12.3	10.0	6.8	6.1	2.4	6.7	10.7	3.6	4.4	1.7	4.3	3.3	6.1	4.3	3.4	2.30	4	29.8	36.0	27.0	28.0
10.0	13.1	12.3	10.1	6.7	6.0	3.0	8.4	10.0	3.7	4.7	1.5	5.0	3.5	6.3	4.8	3.2	2.80	3	29.0	36.0	26.0	26.0
10.1	13.6	12.5	10.3	6.0	5.8	2.1	7.2	10.0	3.4	3.9	2.2	4.7	3.4	6.0	4.6	3.7	2.65	2	29.6	36.2	26.5	28.4
10.0	13.0	12.0	10.4	6.4	6.2	2.0	8.6	10.6	3.7	4.5	1.7	4.5	3.3	5.4	4.1	2.7	2.70	2	28.0	35.0	26.0	24.0
9.7	13.7	12.1	11.1	7.0	6.5	2.6	7.1	10.7	4.0	4.7	1.8	4.8	3.3	6.8	4.6	3.4	2.80	3–4	30.2	35.7	28.0	25.0
9.6	12.5	11.6	10.0	7.2	6.4	2.8	8.6	11.3	3.7	5.0	2.0	5.0	3.4	6.7	4.9	3.2	2.90	3	29.8	36.5	26.0	27.8
9.5	12.3	11.2	9.5	6.4	6.0	3.1	7.8	9.0	3.7	4.9	1.2	5.0	3.6	6.2	4.5	3.4	2.55	3	27.8	34.2	26.0	26.5
10.0	13.5	12.8	10.2	7.8	7.0	2.0	5.4	12.2	4.0	5.0	2.0	4.7	3.5	6.3	5.0	3.7	2.70	4–5	31.3	37.0	28.0	26.0
10.1	13.1	12.2	10.0	7.4	6.7	2.9	8.0	10.8	3.8	4.9	2.0	4.8	3.2	6.3	4.9	4.0	2.75	5	29.0	33.7	27.0	26.0

TABLE 1.—*Actual measurements, in*

Serial No.	Clinical No.	Age.	Body.														Head.		
			Stature.	Sitting height.	Pubic height.	Umbilical height.	Sternal height.	Chin height.	Ear height.	Ankle height.	Knee height.	Trochanter height.	Finger-tip height.	Wrist height.	Elbow height.	Acromion height.	Maximum.		
																	Length.	Breadth.	Height.
41	712	65	143.0	72.3	77.5	90.2	116.5	125.5	132.4	5.2	38.6	76.0	48.0	65.5	87.8	117.0	16.8	14.2	11.5
42	711	30	140.8	73.8	72.5	87.6	114.0	119.4	129.0	5.3	37.4	74.4	48.0	63.2	84.7	115.5	17.2	14.0	12.1
43	735	30	153.7	79.9	85.8	96.2	124.0	130.5	140.2	5.6	39.6	80.8	58.0	74.0	95.0	126.0	17.6	14.5	12.5
44	741	36	147.2	78.9	74.20	88.5	117.0	124.0	135.0	5.0	38.5	74.0	46.7	64.0	87.3	119.7	17.1	14.0	12.0
45	762	(*)	152.2	80.5	77.2	93.0	122.0	128.0	138.5	4.9	41.4	80.5	55.0	71.7	92.7	122.8	17.2	14.6	12.3
46	822	70	136.8	73.3	70.5	81.0	109.5	115.0	125.0	5.2	36.3	71.0	53.0	67.0	86.0	112.0	17.5	14.3	12.5
47	824	25	143.5	78.1	73.0	87.0	117.0	122.5	132.5	4.5	35.0	73.0	56.8	71.3	92.3	118.0	17.4	14.8	12.4
48	823	38	152.2	82.9	76.5	91.8	122.5	131.3	141.0	5.3	38.2	78.0	53.2	70.0	90.5	124.4	18.1	13.8	11.8
49	771	50	140.3	73.2	72.8	85.8	113.0	120.5	130.5	4.5	36.8	71.8	50.0	66.2	86.3	113.0	16.5	14.1	11.3
50	752	18	149.8	76.3	80.8	92.5	122.3	128.6	138.0	5.2	40.5	80.0	55.0	71.6	93.2	123.0	16.2	14.1	11.5
51	745	30	154.8	82.7	80.0	94.3	125.4	131.0	142.5	6.2	41.6	83.0	55.3	73.0	93.5	127.5	18.1	14.2	12.3
52	-----	46	150.3	79.0	77.0	89.8	118.0	127.3	136.4	6.2	38.8	76.7	52.5	68.0	90.5	121.0	17.3	14.6	12.0
53	-----	30	145.2	79.3	74.3	90.6	116.2	122.3	133.0	4.5	37.5	75.8	50.8	67.5	88.5	119.0	17.9	15.1	12.8
54	957	25	147.8	78.8	75.5	90.0	119.0	125.6	135.5	5.5	40.2	80.7	54.5	69.0	91.2	117.6	17.5	14.2	12.0
55	859	33	142.5	76.0	73.0	87.3	114.5	121.8	130.0	5.0	39.0	73.8	53.0	69.0	89.5	116.0	16.7	14.6	11.8
56	729	35	153.0	79.9	75.6	94.0	122.6	129.5	138.8	6.8	42.8	79.7	56.4	72.7	95.2	125.0	17.2	15.0	12.0
57	818	25	150.4	77.7	79.7	93.0	123.0	130.0	137.0	5.1	43.4	81.0	54.5	70.3	92.3	123.0	18.8	14.9	12.4
58	817	60	138.0	71.3	72.5	87.0	112.0	117.0	127.5	5.0	37.0	72.7	47.0	62.0	82.5	110.0	17.5	14.5	11.8
59	821	50	142.8	77.0	72.3	83.0	113.6	120.0	129.0	5.7	38.5	71.8	51.8	68.5	89.3	114.4	17.5	15.1	13.0
60	-----	38	155.8	79.0	79.20	95.6	126.0	131.0	142.0	5.8	44.0	84.5	58.4	74.0	95.8	128.6	18.0	14.1	12.3
61	-----	32	147.0	76.28	70.8	88.0	119.1	124.0	135.0	5.3	38.0	73.3	54.0	69.6	90.5	119.6	17.5	15.0	12.5
62	955	30	140.0	75.1	72.5	84.4	113.0	120.5	126.7	5.6	38.8	72.0	50.8	64.2	87.6	114.4	16.6	14.5	12.0
63	920	30	148.8	81.0	75.8	91.7	118.6	125.4	135.2	4.7	40.0	78.3	52.0	68.0	87.8	118.3	18.5	14.0	11.7
Average		39.8	147.8	78.5	75.8	89.9	119.3	125.9	135.3	5.5	39.5	76.8	53.9	70.15	91.1	121.0	17.5	14.5	12.1

* Adult.

centimeters—the women of Taytay—Continued.

Head.																						
Forehead width.	Bizygomatic diameter.	Bimastoid diameter.	Bigoniac diameter.	Naso-buccal.	Naso-alveolar.	Nose base.	Nasion hair-line.	Chin-nasion.	Nose width.	Nose length.	Mouth width.	Mouth length.	Ear width.	Ear length.	Ear cartilage.	Interocular distance.	Eye length.	Eye color.	Frontal circumference.	Parietal circumference.	Forehead circumference.	Occipital circumference.
9.5	12.7	11.7	10.0	6.6	6.2	2.6	6.6	9.5	4.3	4.6	0.5	4.8	3.8	6.7	5.1	3.8	2.50	2–3	28.2	34.0	26.3	24.5
9.5	12.4	11.6	9.6	6.3	5.8	2.4	7.3	9.7	3.7	3.8	2.2	4.2	3.6	6.4	5.2	2.7	2.65	2	27.5	34.2	25.5	26.5
10.1	12.7	12.0	9.6	6.7	6.7	2.4	8.0	11.3	3.4	4.5	1.8	4.2	3.0	6.0	4.5	3.4	2.65	2	28.8	36.0	27.0	28.0
10.4	12.8	11.5	10.1	6.4	5 6	2.8	----	----	3.5	4.6	2.1	4.7	3.4	6.1	4.6	3.2	2.90	1–2	28.8	35.0	26.2	25.4
10.2	13.7	12.6	10.0	6.8	5.8	2.7	8.0	10.3	4.0	4.6	1.8	4.3	3.6	6.6	5.2	3.1	3.15	2–3	28.7	35.5	27.7	27.7
10.2	12.7	11.7	9.4	6.5	5.8	2.1	8.5	10.3	4.3	4.1	2.3	4.5	3.7	6.3	4.9	3.8	2.55	3–4	28.6	34.5	27.0	28.0
10.1	13.5	12.1	10.2	6.8	5.9	2.3	7.5	10.3	3.9	4.4	1.8	5.0	3.5	6.3	4.7	3.7	2.95	2	30.0	34.4	28.0	24.5
10.0	12.8	11.6	9.7	6.6	5.8	2.6	7.1	10.4	3.5	4.3	2.0	4.6	3.4	6.6	4.7	3.0	2.90	3	29.0	33.4	27.6	26.2
10.5	13.0	11.5	10.0	5.8	5.3	1.8	6.4	9.3	3.7	3.7	1.7	4.1	3.0	5.4	4.2	3.5	2.75	4	29.4	33.5	27.0	24.?8
10.0	12.7	12.0	9.7	6.1	5.3	2.4	7.3	9.1	3.6	4.3	2.1	4.2	3.0	6.0	4.9	3.3	3.00	1–2	28.4	33.3	24.5	26.5
10.5	13.1	12.5	10.1	6.6	6.0	3.0	7.4	11.2	3.7	4.6	1.8	4.3	3.3	6.1	4.8	3.6	2.80	3	28.5	33.0	27.0	27.0
10.0	13.3	13.0	11.0	6.5	5.8	2.8	9.0	9.5	4.3	4.7	1.7	5.5	3.5	6.8	5.5	3.0	2.80	3	28.0	35.0	27.0	26.5
11.5	13.8	12.5	10.7	7.0	6.0	2.6	6.2	10.2	4.0	4.4	2.0	4.4	3.0	5.8	4.5	3.6	3.25	3	29.5	35.3	28.5	27.5
10.3	12.4	12.0	9.3	6.5	6.0	2.7	7.8	10.5	3.5	4.1	2.0	4.2	3.7	5.5	4.5	3.2	2.90	3	29.8	35.5	26.7	26.7
9.8	12.5	10.8	10.0	6.3	5.5	2.4	7.4	9.6	3.7	4.4	2.0	4.8	2.7	5.7	4.2	3.3	2.85	2–3	28.2	34.8	26.0	25.0
10.2	13.2	12.4	10.5	6.6	5.4	2.6	8.2	10.4	4.2	4.6	1.9	4.0	3.6	6.5	5.2	3.2	2.75	3	28.6	36.5	25.8	27.3
10.4	13.2	12.7	9.6	6.0	5.6	2.6	9.2	10.2	4.2	4.3	2.0	5.0	3.3	6.2	4.8	3.3	3.25	2	30.6	37.2	27.8	28.5
10.4	13.3	12.3	10.2	7.0	6.2	2.8	9.8	10.5	3.8	4.5	2.0	4.5	3.8	6.7	5.0	3.6	2.60	4	29.4	33.0	23.0	25.0
10.7	13.2	12.4	10.3	7.0	6.3	2.7	7.7	11.2	3.7	4.5	2.8	4.0	3.7	6.9	5.1	3.4	2.80	----	31.0	35.7	27.7	25.7
10.5	14.1	12.6	11.0	6.8	6.2	3.0	7.7	11.4	3.8	4.9	1.7	5.0	3.2	6.3	5.1	3.3	3.15	4	29.3	36.0	27.0	28.0
10.5	13.2	12.3	10.0	6.2	5.9	2.4	8.4	10.0	3.7	4.0	2.4	4.8	3.1	6.1	4.3	3.5	2.75	3	31.0	36.5	28.0	27.0
10.5	13.2	13.2	9.7	6.7	5.9	2.6	8.4	10.2	3.8	4.1	2.3	4.4	3.3	5.7	4.3	3.4	2.90	2	29.2	33.8	26.4	25.5
10.4	13.1	12.1	10.0	6.8	6.2	2.7	8.4	11.2	3.7	4.3	1.7	4.8	3.4	6.2	----	3.8	2.80	4	29.8	34.2	28.0	26.6
10.2	13.1	12.1	10.0	6.6	5.9	2.45	7.8	10.8	3.75	4.4	1.7	4.5	3.4	6.2	4.7	3.3	2.93	3	29.3	35.1	26.8	26.9

TABLE II.—*Indices and calculated*

Species of individuals.	Number.	Clinical No.	Absolute lower leg length.	Relative lower leg length.	Absolute upper leg length.	Relative upper leg length.	Absolute hand length.	Relative hand length.	Absolute fore-arm length.	Relative fore-arm length.	Absolute upper arm length.	Relative upper arm length.	Pubis to umbilicus.	Umbilicus to sternum.	Omphalic index.
Australoid	1	428	35.5	25.2	28.8	20.5	15.4	10.9	17.0	12.1	29.0	20.6	13.1	30.8	42.5
Primitive	2	407	37.4	24.8	35.5	23.5	17.0	11.2	22.2	14.7	27.8	18.4	17.7	28.0	63.2
Primitive	3	393	31.4	21.3	38.5	26.1	17.7	12.0	19.0	12.9	30.3	20.6	16.3?	28.9	56.3
Primitive	4	429	33.2	22.0	39.6	26.2	15.7	10.4	22.2	14.6	32.8	21.7	17.1	28.1	60.8
Australoid	5	427	33.3	22.8	36.6	25.2	16.4	11.1	20.4	13.8	30.4	20.6	17.5	27.5?	63.6
Australoid	6	468	35.7	23.8	36.9	24.7	16.8	11.2	19.6	13.1	30.2	20.2	13.2	29.5	44.5
Blend	7	445	30.4	21.5	36.5	25.8	16.0	11.3	18.6	13.1	28.4	20.0	10.5	30.8	34.0
Iberian	8	443	30.5	21.3	35.2	24.6	16.2	11.3	19.0	13.2	27.5	19.2	13.5	30.8	43.8
Primitive	9	444	33.3	23.4	35.8	25.1	16.3	11.4	20.9	14.7	28.5	20.0	13.4	28.2	47.5
Iberian	10	-----	33.9	23.7	33.6	23.5	16.4	11.4	17.8	12.4	30.5	21.3	13.9	28.9	48.1
Blend	11	460	32.8	22.3	38.3	26.1	16.3	11.1	20.7	14.1	28.2	19.2	12.8	26.7	47.9
Iberian	12	-----	31.3	21.3	39.2	26.7	15.4	10.5	21.8	14.8	30.5	20.8	12.4	30.4	40.7
Primitive	13	468	33.7	22.5	37.2	24.9	15.5	10.3	20.5	13.7	30.7	20.5	13.2	29.6	44.6
B. B. B	14	499	33.8	22.5	38.2	25.4	15.4	10.2	20.9	13.9	31.7	21.1	12.4	27.3	45.4
Blend	15	-----	?	-----	?	-----	15.2	10.1	21.3	14.2	28.0	18.7	17.5	27.2	64.3
Primitive	16	262	33.5	22.4	37.7	25.3	15.6	10.4	21.6	14.5	29.2	19.6	14.8	29.9	47.8
Iberian	17	498	36.6	24.3	31.5	20.9	14.0	9.3	23.0	15.3	30.2	20.0	20.8?	28.4	73.2
Blend	18	-----	30.1	20.9	37.8	26.2	17.8	12.3	19.2	13.3	30.5	21.2	15.9	26.1	60.9
Blend	19	507	34.3	22.9	39.5	26.3	15.7	10.4	23.5	15.7	29.5	19.7	11.4	32.2	35.4
B. B. B	20	433	34.0	21.8	41.5	26.7	17.5	11.2	19.1	12.3	31.3	20.1	12.4	33.0	37.6
Iberian	21	512	36.2	23.3	40.5	26.0	17.2	11.0	23.0	14.8	30.2	19.4	14.8	29.9	49.5
Adriatic	22	-----	34.2	21.9	44.0	28.2	16.3	10.4	21.3	13.6	33.7	21.6	12.7	32.7	38.8
Australoid	23	506	33.5	22.4	38.0	25.4	16.3	10.9	20.5	13.7	34.5	23.0	13.2	30.7	42.9
Iberian	24	213	34.0	21.8	40.9	26.2	16.6	10.6	23.1	14.8	32.0	20.5	11.2	34.6	32.3
Iberian	25	524	37.0	24.0	36.8	23.9	16.0	10.3	21.0	13.6	30.0	19.4	15.1	32.1	47.0
Iberian	26	2	37.9	24.6	38.0	24.7	17.4	11.3	21.0	13.6	32.5	21.1	16.3	27.2	59.9
Iberian	27	221	34.9	22.4	41.9	26.9	14.1	9.1	23.4	15.0	31.2	20.0	15.2	30.6	49.6
Iberian	28	253	32.4	21.3	40.5	26.6	17.6	11.5	21.4	14.0	28.0	18.4	16.7	29.6	56.4
Iberian	29	-----	32.2	21.4	40.3	26.8	17.2	11.4	21.9	14.5	30.7	20.4	14.7	30.5	48.2
Iberian	30	572	36.6	25.4	35.0	24.2	15.8	10.9	19.4	13.3	28.4	19.7	11.6	29.6	39.2
Blend	31	578	30.1	20.9	35.3	24.5	16.0	11.1	20.0	13.9	31.0	21.5	14.0	32.3	46.4
Iberian	32	645	32.0	22.2	34.6	24.0	16.3	11.3	19.1	13.2	27.6	19.1	16.1	29.5	54.5
Blend	33	677	33.8	20.8	39.2	23.9	16.8	10.3	20.8	12.8	30.5	18.7	11.3	33.2	34.0
Blend	34	625	33.2	21.3	40.3	25.9	17.0	10.9	21.4	13.7	32.3	20.7	11.6	31.5	36.8
Blend	35	664	31.9	21.7	34.6	23.5	15.5	10.5	21.0	14.3	30.5	20.7	16.5	30.5	54.0
Blend	36	699	32.6	21.8	39.0	26.1	17.0	11.4	18.5	12.4	29.2	19.6	14.0	29.2	47.9
Iberian	37	70	34.5	22.8	40.0	26.4	17.4	11.5	20.6	13.6	30.0	19.8	14.4	28.5	50.5
Iberian	38	690	32.1	22.0	36.5	25.1	15.8	10.8	19.5	13.4	-----	-----	12.0	31.2	38.4
Alpine	39	-----	33.8	23.3	38.3	26.4	17.3	11.9	23.9	16.5	29.8	20.5	10.3	31.2	33.0
Iberian	40	698	34.7	23.2	37.3	24.9	16.5	11.0	22.5	15.0	29.2	19.5	13.0	29.5	44.0
Blend	41	712	33.4	23.3	37.4	26.1	17.5	12.2	22.3	15.6	29.2	20.4	12.7	26.3	48.2
Australoid	42	711	32.1	22.8	37.0	26.2	15.2	10.7	21.5	15.2	30.8	21.8	15.1	26.4	57.2
Blend	43	735	34.0	22.1	41.2	26.8	16.0	10.4	21.0	13.6	31.0	20.1	10.4	27.8	37.4
Iberian	44	741	33.5	22.7	35.5	24.1	17.3	11.7	23.3	15.8	32.4	21.9	14.5	28.5	50.8

factors—women of Taytay.

Total head height.	Upper face height.	Cephalic index.	Nasal index.	Type of individuals.	Physiognomic face index.	Morphologic face index.	Combined face index.	Ear type.
22.2	12.0	73.80	107.14	Australoid	71.4	78.4	109.8	Iberian C.
22.0	12.4	89.15	90.00	Blend	79.0	70.5	89.1	Mixed B. B. B.
23.4	12.4	86.85	83.33	Blend	80.0	73.5	91.8	Primitive.
23.5	13.0	86.93	90.47	Blend	77.1	77.7	100.7	Mixed.
21.7?	11.3?	77.10	102.40	Australoid	68.2	81.9	120.0	Iberian C.
21.4	10.4	78.57	86.66	Australoid	72.6	84.6	116.5	Iberian C.
19.4	9.4	84.30	85.71	Blend	74.1	77.5	104.5	Iberian A, D, C, Primitive.
23.2	11.5	82.32	75.00	Blend	64.6	89.9	139.1	Iberian C.
20.7	12.0	87.11	114.70	Primitive	83.3	66.9	80.3	
23.3	12.9	84.30	77.08	Blend	71.5	79.3	110.9	Mixed.
21.8	10.8	82.49	81.25	Blend	68.2	86.6	126.9	Iberian C and D.
20.3	11.0	77.89	74.78	Iberian	66.1	74.4	112.5	Iberian C and D.
20.1	10.4	84.61	100.00	Modified Primitive	75.6	72.9	96.4	Iberian D.
23.2	12.4	90.53	84.00	Alpine or B. B. B	71.3	79.0	110.8	Mixed Iberian, B. B. B.
22.9	-----	87.71	80.43	Blend	-----	-----	-----	Iberian C and D.
20.7	11.3	95.57	92.10	Modified Primitive	78.7	68.6	87.1	Primitive, odd type.
21.6	10.8	79.44	84.10	Blend	68.6	81.8	119.2	Iberian D and C.
20.3	10.9	85.88	94.87	Blend	76.6	73.4	95.8	Iberian B and C.
22.7	12.1	83.43	88.88	Blend	68.8	82.8	120.3	Iberian C.
23.3	13.3	85.50	66.00	B. B. B	80.5	70.9	88.0	Iberian C.
24.5	13.6	77.72	77.07	Iberian	69.0	80.1	116.0	Iberian C and D.
22.2	11.2	87.00	105.26	Adriatic	72.0	81.9	113.7	Mixed Iberian ?
22.3	12.3	80.11	97.75	Australoid	78.3	74.6	95.2	Iberian C and D.
23.5	11.9	80.54	76.92	Blend	74.3	85.2	114.6	B. B. B., Iberian D.
21.0	11.0	77.77	81.39	Iberian	71.1	75.1	105.6	Iberian, B. B. B., Primitive.
22.8	12.4	81.28	77.77	Blend	71.4	80.0	112.0	Iberian D.
23.9	12.8	78.83	75.51	Iberian	64.8	86.0	132.7	Iberian and Primitive.
22.0	11.4	79.00	84.78	Blend	69.5	78.5	112.9	B. B. B.
23.3	12.8	77.46	85.71	Iberian	68.1	83.3	122.8	Iberian C and D.
21.1	11.4	78.68	68.08	Iberian	67.0	80.8	120.6	Iberian A.
20.3	10.2	83.33	82.92	Blend	71.8	77.6	108.0	Iberian D.
21.5	10.8	79.46	81.81	Blend	73.5	83.5	113.6	B. B. B., Iberian.
31.4?	21.4?	89.75	78.72	Blend	71.1	76.3	107.3	Iberian C and D.
22.4	12.4	83.14	87.17	Blend	79.0	73.5	93.0	Mixed Primitive.
22.1	11.5	87.50	82.22	Blend	67.7	81.5	120.4	Mixed Iberian.
25.3	14.6	81.00	85.10	Blend	76.9	78.1	101.5	B. B. B., Iberian.
24.0	12.7	76.06	74.00	Iberian	62.8	90.4	143.9	Iberian D.
21.7	12.7	78.85	75.51	Iberian	73.2	73.1	99.8	Iberian D.
20.7	8.5	95.23	80.00	Alpine	76.7	90.3	117.7	Iberian B, Alpine.
19.8	9.0	78.33	77.50	Iberian	69.6	82.4	118.4	Iberian D.
17.5	8.0	84.52	93.47	Blend	78.8	74.8	94.9	Iberian D.
21.4	11.7	81.39	97.30	Australoid	72.9	78.1	107.1	Iberian D.
23.2	11.9	82.38	75.55	Blend	65.8	88.9	135.1	Odd type Iberian.
23.2	-----	81.87	76.08	Blend	-----	-----	-----	B. B. B., Iberian.

TABLE II.—*Indices and calculated*

Species of individuals.	Number.	Clinical No.	Absolute lower leg length.	Relative lower leg length.	Absolute upper leg length.	Relative upper leg length.	Absolute hand length.	Relative hand length.	Absolute fore-arm length.	Relative fore-arm length.	Absolute upper arm length.	Relative upper arm length.	Pubis to umbilicus.	Umbilicus to sternum.	Omphalic index.
Blend	45	762	36.5	23.9	39.1	25.6	16.7	10.9	21.0	13.8	30.1	19.7	15.8	29.0	54.4
Australoid	46	822	31.1	22.7	34.7	25.3	14.0	10.2	19.0	13.8	26.0	19.0	10.5	28.5	36.8
Blend	47	824	30.5	21.2	38.0	26.4	14.5	10.1	21.0	14.6	25.7	17.9	14.0	30.0	46.6
Iberian	48	823	32.9	21.6	39.8	26.1	16.8	11.0	20.5	13.4	33.9	22.2	15.3	30.7	49.5
Primitive	49	771	32.3	23.0	35.0	25.6	16.2	11.5	20.1	14.3	26.7	19.0	13.0	27.2	47.7
Blend	50	752	35.3	23.5	39.5	26.3	16.6	11.0	21.6	14.4	29.8	19.8	11.7	29.8	39.2
Iberian	51	745	35.4	22.8	41.4	26.7	17.7	11.4	20.5	13.2	34.0	21.9	14.3	31.1	45.9
Blend	52	-----	32.6	21.6	37.9	25.2	15.5	10.3	22.5	14.9	30.5	20.2	12.8	28.2	45.3
Blend	53	-----	33.0	22.7	38.3	26.3	16.7	11.5	21.0	14.4	30.5	21.0	16.3	25.6	63.6
Blend	54	957	34.7	23.8	40.5	27.1	14.5	9.9	22.2	15.2	26.4	18.1	14.5	29.0	50.0
Primitive	55	859	34.0	23.8	34.8	24.4	16.0	11.2	20.5	14.3	26.5	18.5	14.3	27.2	52.5
Blend	56	729	36.0	23.5	36.9	24.1	16.3	10.6	22.5	14.6	29.8	19.5	18.4	28.6	64.3
Australoid	57	818	38.3	25.4	37.6	25.0	15.8	10.5	22.0	14.5	30.7	20.4	13.3	30.0	44.3
Blend	58	817	32.0	23.1	35.7	25.8	15.0	10.8	20.5	14.8	28.0	20.2	14.5	25.0	58.0
Blend	59	821	32.8	22.9	33.3	23.3	16.7	11.7	20.8	14.5	25.1	17.5	10.7	30.6	34.9
Iberian	60	-----	38.2	24.5	40.5	25.9	15.6	10.0	21.8	13.9	32.8	21.0	16.6	30.4	54.6
Primitive	61	-----	32.7	22.2	35.3	24.0	15.6	10.6	20.9	14.2	29.1	19.8	17.2	31.0	55.4
Primitive	62	955	33.2	23.7	33.2	23.7	13.4	9.5	23.4	16.7	26.8	19.1	11.9	28.6	41.6
Australoid	63	920	35.3	23.7	38.3	25.7	16.0	10.7	19.8	13.3	30.5	20.4	15.9	26.9	59.1
Average	----	-----	33.7	22.7	37.5	25.2	16.1	10.8	20.9	14.1	29.8	20.1	14.0	29.4	48.2

factors—women of Taytay—Continued.

Total head height.	Upper face height.	Cephalic index.	Nasal index.	Type of individuals.	Physiognomic face index.	Morphologic face index.	Combined face index.	Ear type.
24.2	13.9	84.88	86.95	Blend	74.8	75.1	100.4	B. B. B., Iberian mixed.
21.8	11.5	81.71	104.80	Australoid	67.5	81.1	120.1	Mixed B. B. B.
21.0	10.7	87.06	88.63	Blend	75.8	76.3	100.6	Iberian C.
20.9	10.5	76.42	81.39	Iberian	73.1	81.2	111.0	Iberian C.
19.8	10.5	85.45	100.00	Primitive	82.8	71.5	86.3	Iberian mixed.
21.8	12.7	87.03	83.71	Blend	77.4	71.6	92.5	Primitive, Iberian.
23.8	12.6	78.45	80.43	Iberian	70.4	85.4	121.3	B. B. B., Iberian.
23.0	13.5	84.39	91.48	Blend	71.8	71.4	99.4	Iberian D.
22.9	12.7	84.35	90.90	Blend	84.1	73.9	87.8	Iberian C mixed.
22.2	11.7	81.14	85 36	Blend	67.7	84.6	124.0	Iberian B.
20.7	11.1	87.42	84.09	Blend	73.5	76.8	104.4	Primitive.
23.5	13.1	87.20	91.30	Blend	70.9	78.7	111.0	Mixed.
20.4	10.2	79.20	97.60	Blend	68.0	77.2	113.5	B. B. B., Iberian.
21.0	10.5	82.09	84.44	Blend	65.5	78.9	120.4	Mixed Iberian.
22.8	11.6	86.20	82.20	Blend	69.8	84.8	121.5	Iberian., B. B. B.
24.8	13.4	78.33	77.55	Iberian	73.8	80.8	109.4	Mixed Iberian.
23.0	13.0	85.71	92.50	Blend	71.7	75.7	105.5	B. B. B. mixed.
19.5	9.3	87.35	92.68	Blend	70.9	77.2	108.8	Mixed Primitive.
23.4	12.2	75.70	86.04	Australoid	66.8	85.4	127.8	Iberian.
22.2	11.8	82.93	86.00		-----	79.1	------	

ILLUSTRATIONS.

PLATE I. WOMEN OF TAYTAY.

FIG. 1. Iberian, (D).
2. Primitive (Blend).
3. Dwarf.
4. Primitive (Blend).
5. B. B. B.

PLATE II. WOMAN OF TAYTAY.

FIG. 1. Primitive (Blend). Side view
2. Primitive (Blend). Front view.

PLATE III. WOMAN OF TAYTAY.

FIG. 1. Primitive (Blend). Front view.
2. Primitive (Blend). Side view.

PLATE IV. WOMAN OF TAYTAY.

FIG. 1. Iberian (D). Front view.
2. Iberian (D). Side view.

PLATE V. WOMAN OF TAYTAY.

FIG. 1. A Modified B. B. B. type. Front view.
2. A Modified B. B. B. type. Side view.

PLATE VI. WOMAN OF TAYTAY.

FIG. 1. Primitive (Blend). Front view.
2. Primitive (Blend). Side view.

PLATE VII. A DWARF OF TAYTAY.

FIG. 1. Front view.
2. Side view.

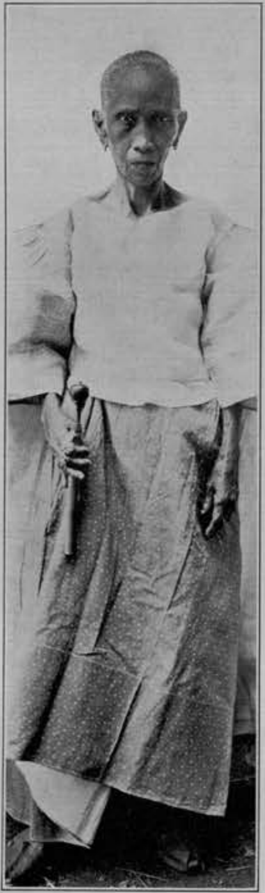


FIG. 1. IBERIAN (D).

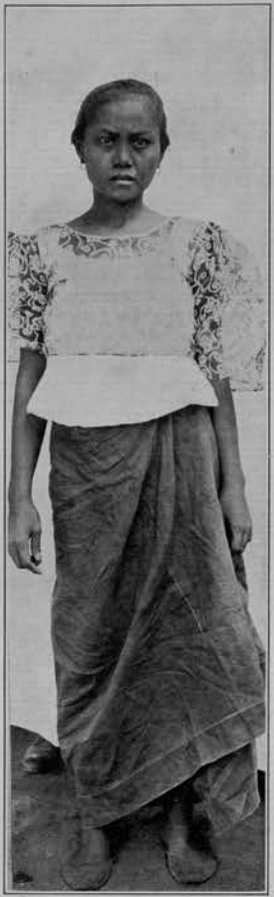


FIG. 2. PRIMITIVE (BLEND).

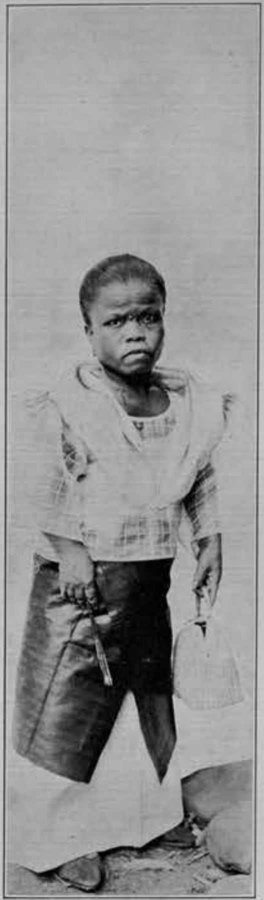


FIG. 3. DWARF.

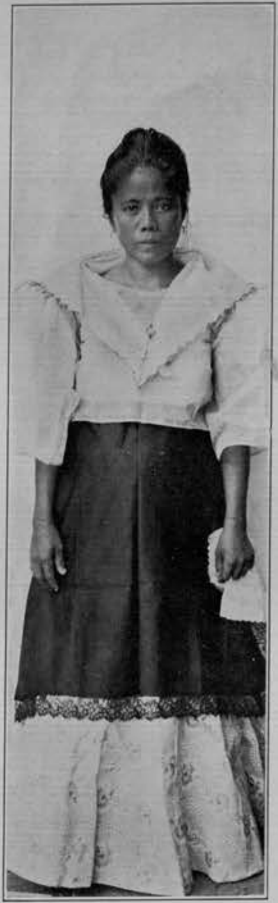


FIG. 4. PRIMITIVE (BLEND).

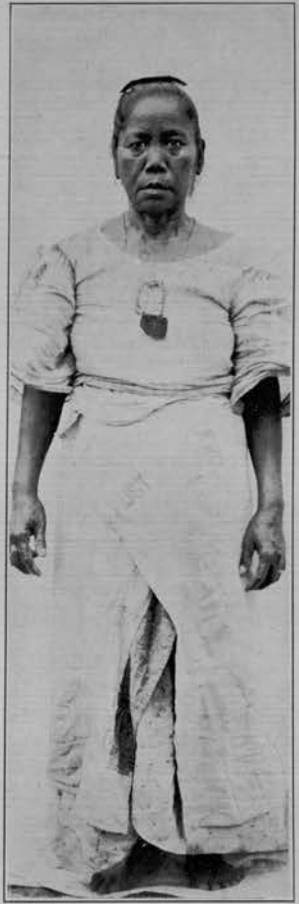


FIG. 5. B. B. B.

PLATE I.

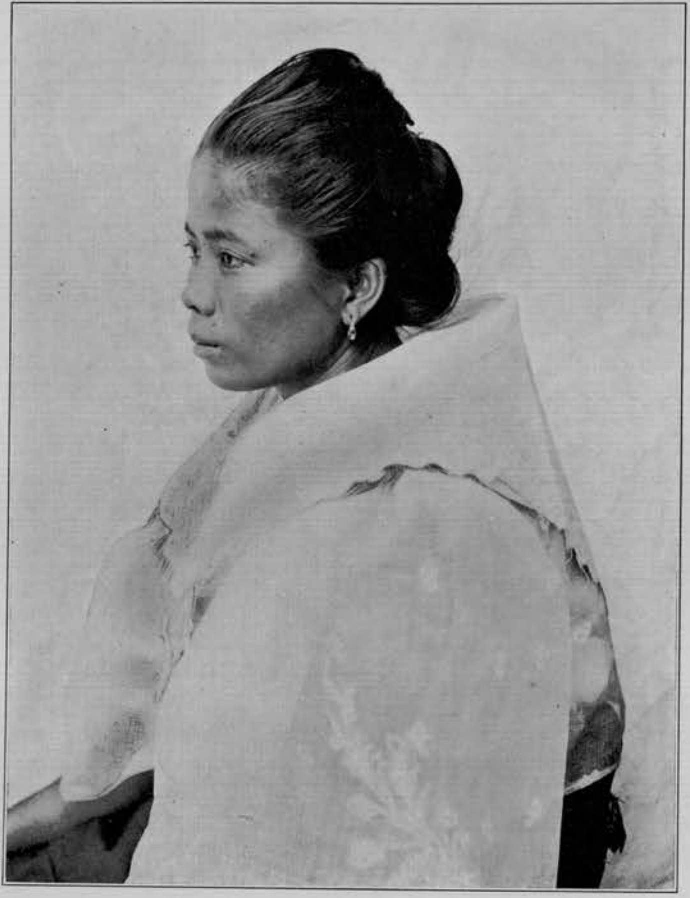


FIG. 1. SIDE VIEW.

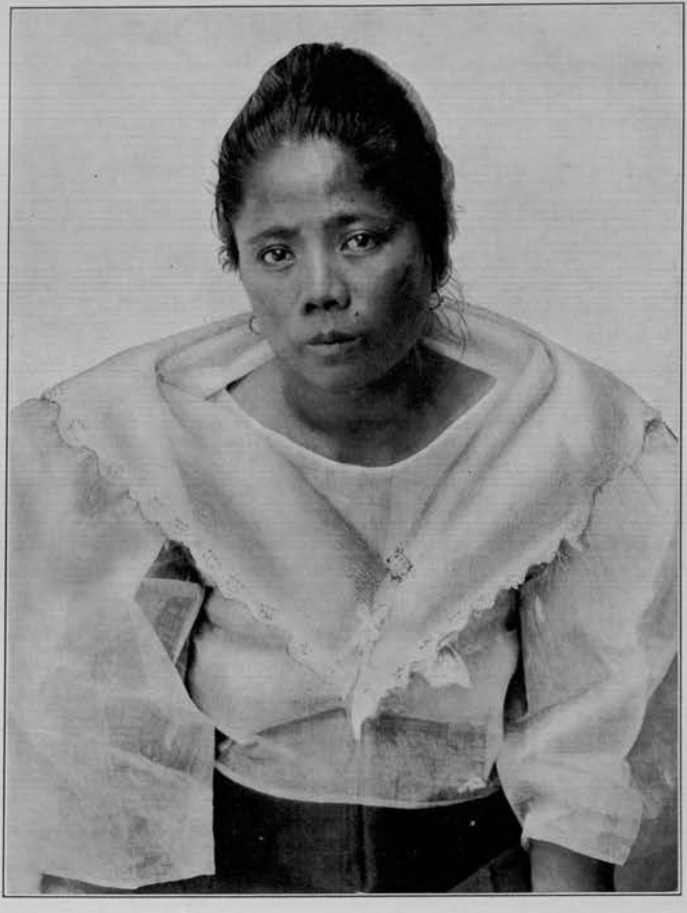


FIG. 2. FRONT VIEW.

PLATE II.

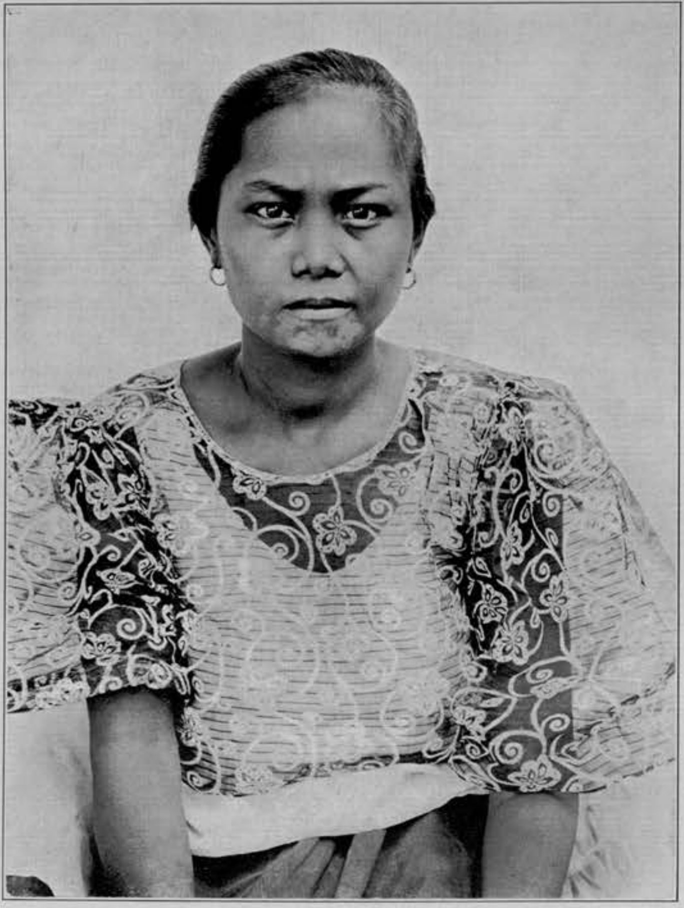


FIG. 1. FRONT VIEW.

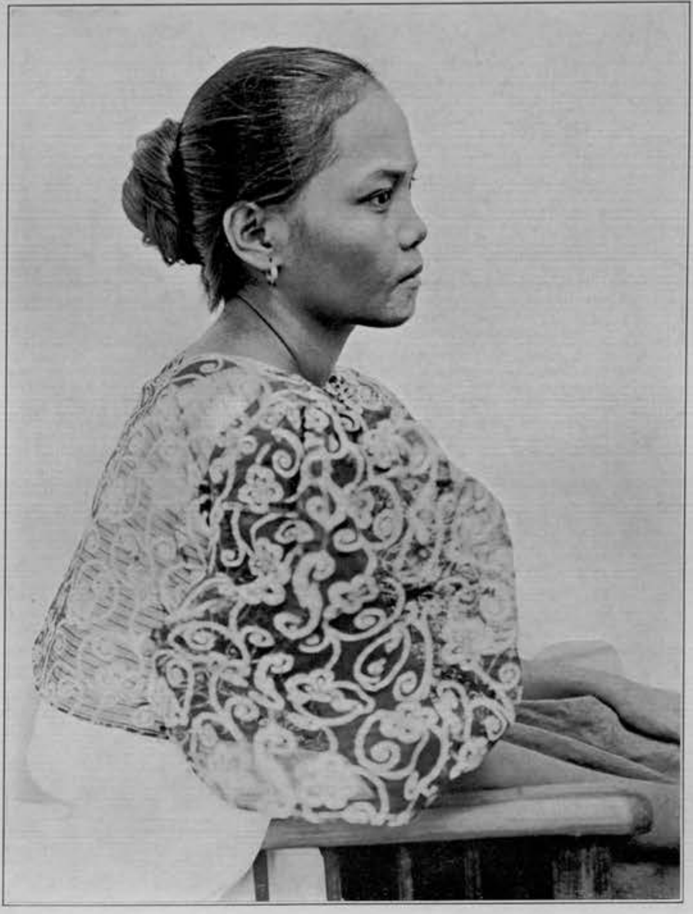


FIG. 2. SIDE VIEW.

PLATE III.

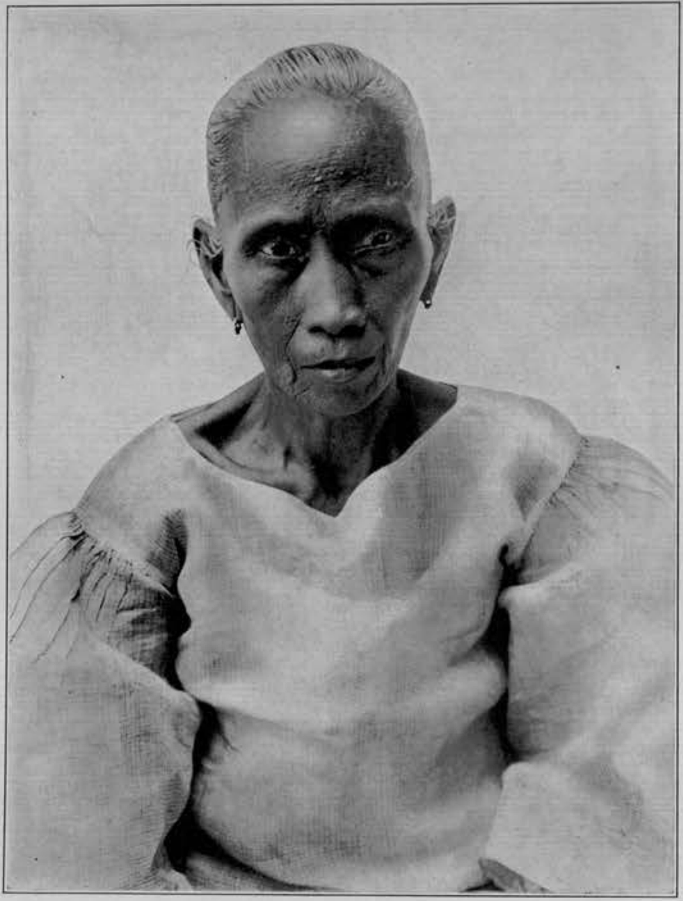


FIG. 1. FRONT VIEW.

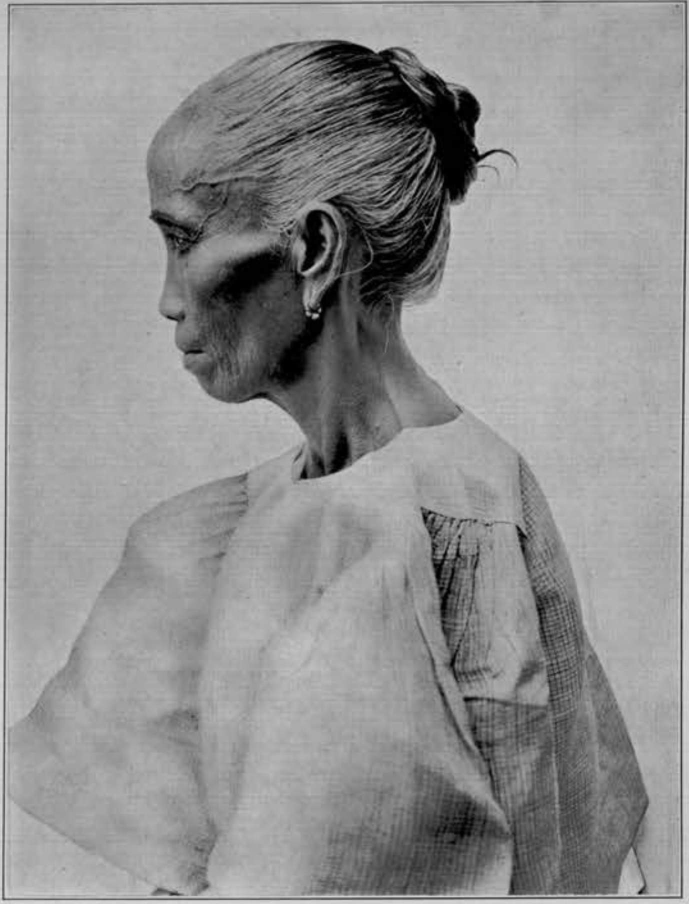


FIG. 2. SIDE VIEW.

PLATE IV.

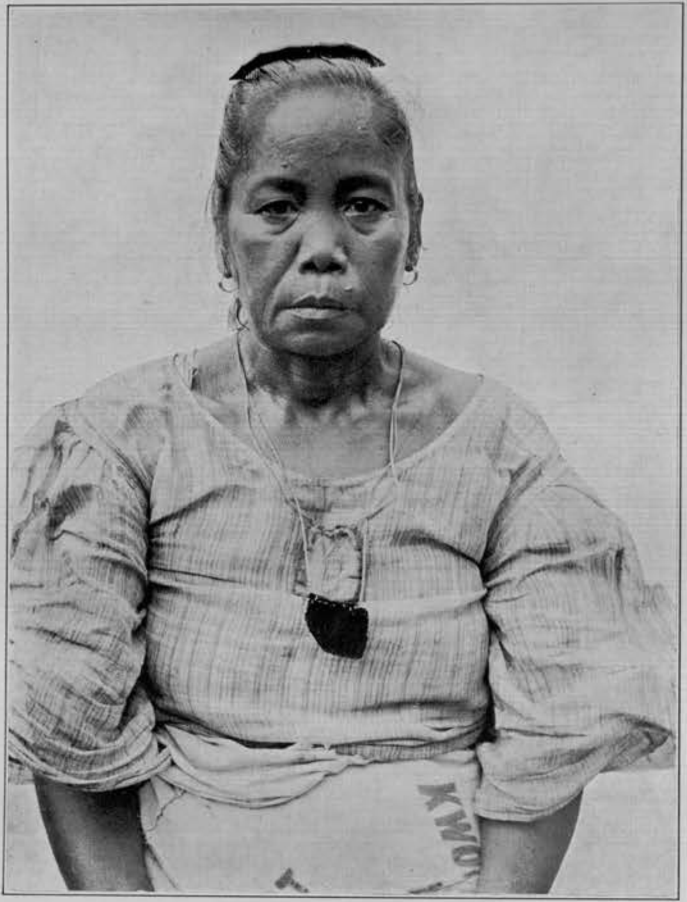


FIG. 1. FRONT VIEW.

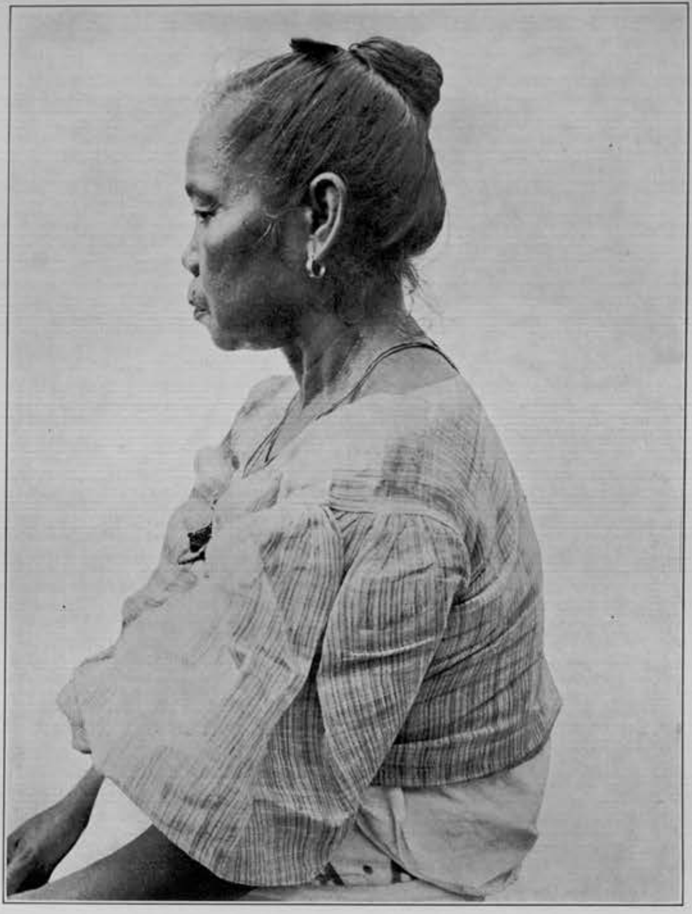


FIG. 2. SIDE VIEW.

PLATE V.

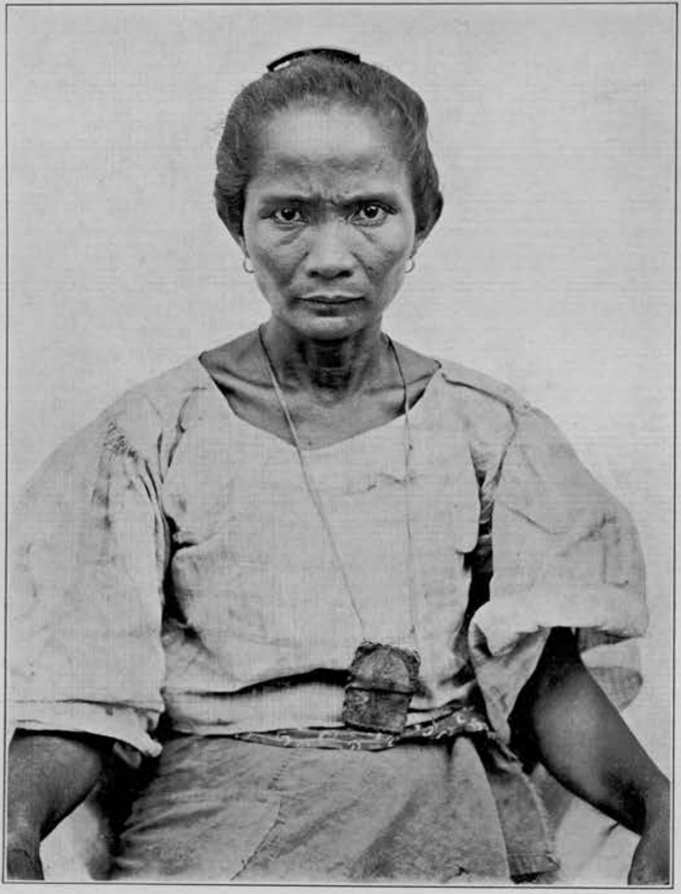


FIG. 1. FRONT VIEW.

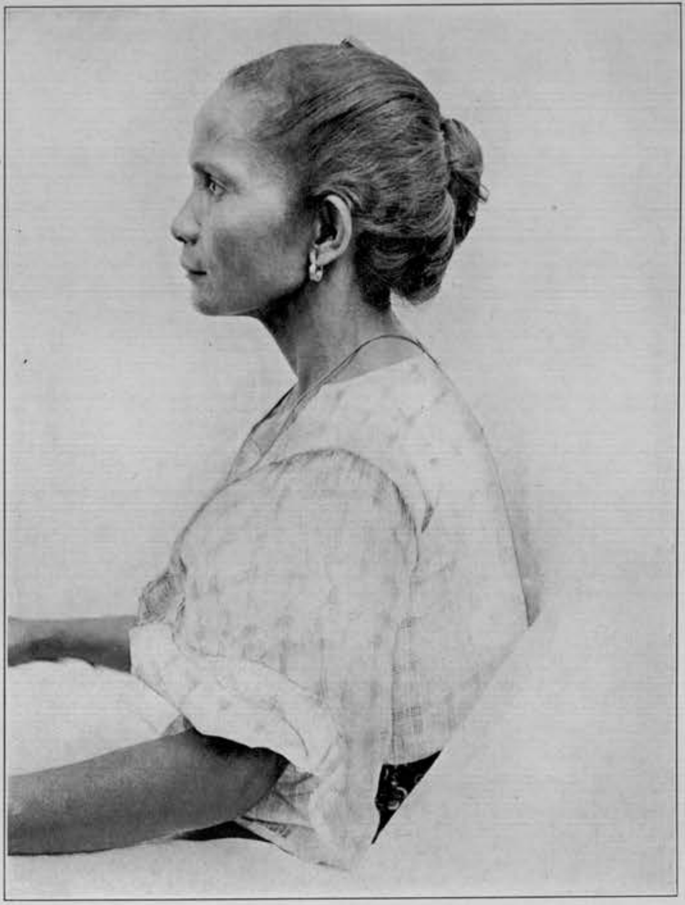


FIG. 2. SIDE VIEW.

PLATE VI.

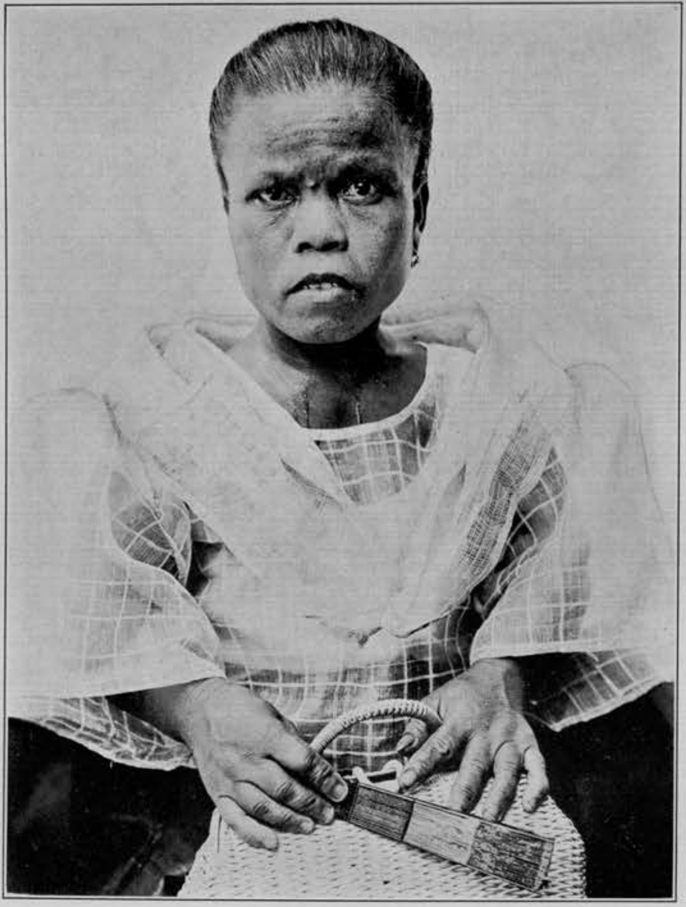


FIG. 1. FRONT VIEW.

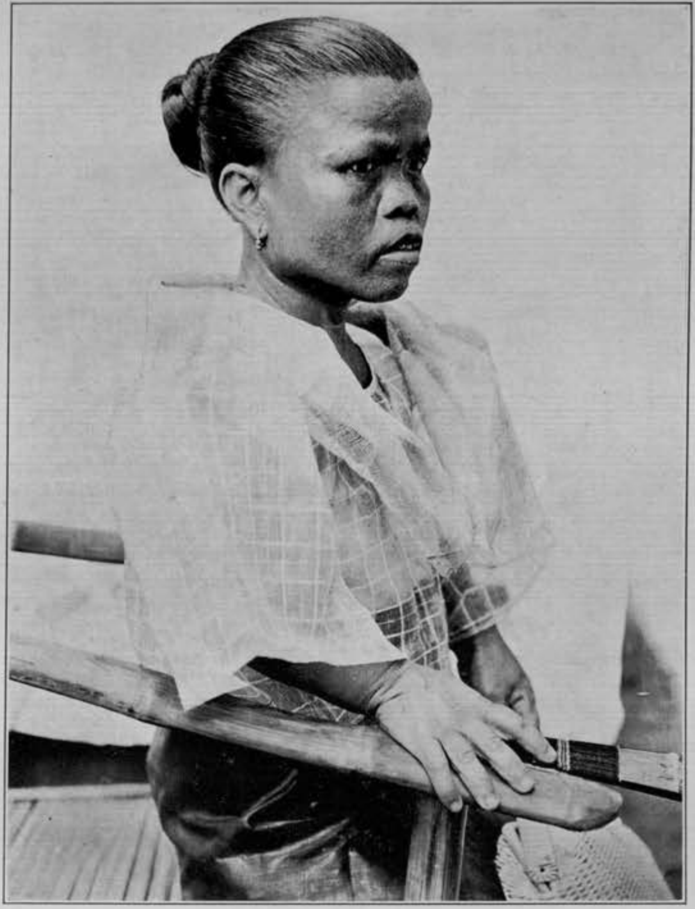


FIG. 2. SIDE VIEW.

PLATE VII.

PALEOLITHIC MAN IN THE PHILIPPINES. HOMO PHILIPPINENSIS.

By Robert Bennett Bean.

(*From the Anatomical Laboratory, Philippine Medical School, Manila, P. I.*)

The discovery of a lower jaw at Mauer, near Heidelberg, by Dr. Otto Schoetensack, on October 21, 1907, marks the earliest form of man yet found in Europe. This man has been called *Homo heidelbergensis*, and the jaw is peculiar in that it unites two seemingly contradictory qualities: massiveness of jaw with absence of chin ("negative chin formation," H. Klaatsch), and an especially square, ascending ramus, qualities called pithecoid. *Homo heidelbergensis* belongs to the earliest paleolithic age, or to the transition period from Diluvium to late Tertiary (pliocene).

Another early paleolithic form was recently discovered in the lower grotto of Le Moustier (Dordogne), where a skeleton was unearthed bearing the marks of the older Diluvial race, resembling the Neanderthal type. The massive proportions of the chinless jaw are remarkable. The femur is extraordinarily short, the length is estimated at 19.5 centimeters, and the lower extremities are necessarily short.

Another find of great importance occured in France near La Chapelle-aux-Saints (Correze) on August 3, 1908, in the form of a skeleton of a man in an absolutely undisturbed stratum, by the Abbés A. and J. Bouyssonie and L. Bardon. The subject was an old man of about 160 centimeters stature. The skull is dolichocephalic, with an index of 75; its height is small; the huge round orbits and wide nasal apertures resemble the Neanderthal skulls. The face is prognathous and the mandible is very large, with absence of chin.

The cultural and fossil findings in connection with the remains place them in three succeeding periods of time, *Homo heidelbergensis* being older, and the other two more recent and of about the same date, but all of great antiquity.

Men of similar form may be seen in the Philippines to-day, rarely, it is true, but the close observer who lives among the people of different parts of the Archipelago for years can hardly fail to notice such types. It was my good fortune to make observations and measurements of such a man at Taytay, in the Province of Rizal, Island of Luzon, on April 5, 1909, during my anthropometric survey of the town. The man came to the clinic of the Free Dispensary which was being operated during the survey and was treated for sexual neurasthenia. He disappeared as quietly as he came, and I was unable to find him again. He did not live in Taytay, and some of the people there said that he came in from the hills that lie immediately back of the town. I endeavored to obtain a photograph, but unfortunately the Government photographer was absent on that day and the only camera available was inadequate. However, this was utilized and the resulting photographs are reproduced here for the first time. (See Plate I, figs. 1 and 2.)

The features of this man are large and heavy, the lower jaw is heavy, long, square and narrow, with "negative chin formation." The brow ridges protrude, the cheeks are large and prominent, the nose is massive, wide, straight and depressed at the nasion, and the lips are full and thick. The brow ridges are noticeably prominent. The upper lip is broad from its border to the nasal spine, a distance of 2.7 centimeters, and the peculiarity of it is the rounded contour between the nasal spine and lip margin as seen in profile. The face is prognathous, the facial angle 70°—glabella, nasal spine, external auditory meatus—is not greater nor less than that of many other Filipinos, although it is 7° to 8° less than that of the Igorots measured in the same way. Nevertheless, about 30 per cent of the Igorots have the same index and 4 per cent one of less than 70°. The nasal index is 102.2, the cephalic 73.68, and the stature 156.8 centimeters. The head height from the upper part of the external auditory meatus to the bragma is 12.5 centimeters. The ear is a combination of Primitive and Iberian, and should be called the Australoid ear. The orbits are large and round, the forehead is low and the glabella is prominent. The sagittal head outline is low, long, and somewhat flat over the lambda, and might very well represent the combined Primitive and Iberian head outline in the form of the Australoid. The type falls within the group I have designated as Australoid, because it is long headed, broad nosed, and small in stature, but this man is a form somewhat apart, typical of neither the *primary* nor the *secondary* Australoid. The following actual dimensions are given to complete the description:

[Name, Alejandro Mesa; age, 55 years.]

	Centimeters.		Centimeters.		Centimeters.
Stature	156.8	Head breadth	14.0	Lip width (2)	1.8
Sitting height	84.5	Head height	12.5	Lip length	1.9?
Heel to umbilicus	95.5	Bizygomatic diameter	14.1	Ear breadth	3.6
Heel to sternum	125.7	Narrowest forehead	10.0	Ear length	6.2
Heel to pubis	81.2	Chin to nasion	10.6	Distance between the eyes	3.5
Heel to ankle	6.7	Nasion to hair line	6.0	Distance between the outer corners	9.7
Heel to knee	44.0	Bimastoid diameter	13.0	Eye color by Martin's artificial eyes, No. 3.	
Heel to trochanter	80.1	Bigoniac diameter	10.2	Right handed.	
Heel to finger tip	54.0?	Naso-buccal distance	7.2		
Heel to wrist	73.4	Naso-alveolar distance	5.8		
Heel to elbow	95.0	Nose height	2.3		
Heel to acromion	125.6	Nose breadth	4.6		
Head length, glabella—maximum occipital	19.0	Nose length	4.5		

The upper leg length, or approxmately the femur length, is less than that of the lower leg or tibia, which would give a high crural index, a characteristic of the Australoid type.

A fair consideration of the physical characteristics of this man will show necessarily his close relationship to the Neanderthal type. The massive lower jaw with its square ramus and receding chin; the low cephalic index, heavy brow ridges, rounded orbits, large nasal apertures and high nasal index; the small stature, but muscular frame and the short upper leg or femur, all betoken a form similar to that of the antediluvial man of Europe, *Homo heidelbergensis.*

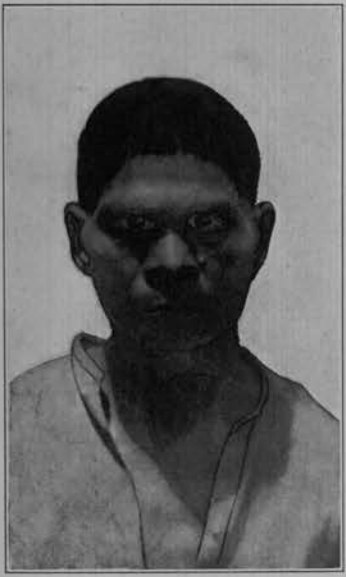
I believe this is the fundamental type of the Philippines, and it is closely allied to the Australoid, which I have found in groups of individuals from all parts of the Archipelago. Whether this form originated here or elsewhere may not be known, but the probability is that it is a production of the East rather than of Europe, although it may have wandered away from Europe during the ages of ice and cold, coming to the East for a more equable climate. A form resembling the Australoid that has been found in the great islands of the Pacific Ocean, Borneo, Java, Sumátra, Ceylon, Celebes, and in the Malay Peninsula indicates that this may have been their original home.

Whatever the origin of this man there can be no doubt of the presence in considerable numbers of nearly related forms in the Philippine Islands, therefore I propose the name *Homo philippinensis* for this type. The description and measurements given above serve to characterize the type.

ILLUSTRATION.

PLATE I.

FIGS. 1 and 2. *Homo Philippinensis.*



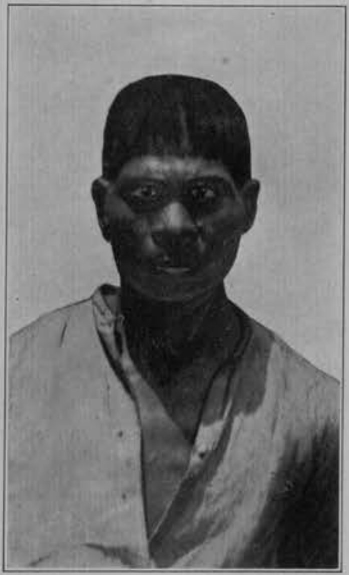


PLATE I.

RHYNCHOTA PALAWANICA, PART II. HOMOPTERA.

By Charles S. Banks.

(From the Entomological Section, Biological Laboratory, Bureau of Science, Manila, P. I.)

The first part of this paper, published in this Journal, November, 1909, contained that portion of the Rhynchota of Palawan belonging to the suborder Heteroptera. The remainder of the collections of Messrs. Weber and Schultze, containing the Homoptera, is much smaller but consists of some very interesting forms. A total of 45 species, including 8 new species in 38 genera, one of which is new, is here recorded. Many of the species are noted from these Islands for the first time. The total number of species recorded in this and the previous paper is 130, of which 20 are new, comprising 103 genera, 2 of which are new.

It will be noted that, with the exception of Tara Island and Bacuit, the chief collecting was done in the immediate vicinity of Iwahig, located at about the central portion of the Island of Palawan. There is no doubt but that careful collecting by one familiar with this order would result in our obtaining four or five times as many species both in Heteroptera and Homoptera.

RHYNCHOTA.

HOMOPTERA.

Fam. CICADIDÆ.

Subf. CICADINÆ.

Div. POLYNEURARIA.

PLATYPLEURA Amyot et Serville.

Hist. des Hém. (1843) 465.
Type: *P. stridula* Linn.

1. **Platypleura fulvigera** Walk.
   Platypleura fulvigera Walk., List Hom. (1850) **1**, 9.
   Pœcilopsaltria fulvigera Stål, Berl. Ent. Ztschr. (1866) **10**, 169, Ö. V. A. F. (1870) 707; Butl., Cist. Ent. (1874) **1**, 185; Dist., Mono. Orient. Cicadid. (1889–1892) 13, *pl. 1, fig. 2, a, b,* (var.).

Palawan, Bacuit and Tara Island, P. I. (11655 and 11721 *C. M. Weber*), 2 specimens. This species is common in all parts of the Philippines. During the months of August and September its songs may be heard at certain hours of the day in any part of the city of Manila.

Div. CICADARIA.

CRYPTOTYMPANA Stål.

Ann. Soc. Ent. Fr. (1861) (4) **1**, 613.
Type: *C. pustulata* Fabr.

2. Cryptotympana ?varicolor Dist.
Cryptotympana varicolor Dist., Ann. Mag. Nat. Hist. (1904) (7) **14**, 430, Fauna British Ind., Rhyn. (1906) **3**, 86.

I doubtfully refer the seven specimens to this species. The chief differences between the specimens before me and *C. acuta* Sign., appear to be in their lacking the dorso-lateral white fasciæ on the abdomen and in having the ♂ opercula very long and acute. They extend beyond the caudo-lateral margins of the abdomen and their apices, which are strongly hairy, are about in line with the apex of the penultimate abdominal segment. There is a dark brown median ventral fascia on the abdomen extending to the base of the penultimate segment only in the ♂, while in the ♀ this fascia extends to the apex of the ovipositor. The lateral portions of the sternites in both sexes are covered with golden yellow or white sericeous pile. Distant gives a description of the ♀ only.

Palawan, Iwahig, P. I. (10891 *W. Schultze;* 11968 *C. M. Weber*), 7 specimens, 4 ♂ and 3 ♀. This is the first record of this species as from the Philippines if it prove to be *varicolor.*

Div. DUNDUBIARIA.

LEPTOPSALTRIA Stål.

Hem. Afr. (1866) **4**, 5.
Type: *Leptopsaltria tuberosa* Sign.

3. Leptopsaltria quadrituberculata Sign.
Cicada quadrituberculata Sign., Ann. Soc. Ent. Fr. (1847) (2) **5**, 297.
Dundubia quadrituberculata Walk., List Hom. (1850) **1**, 78. Stål, Ann. Soc. Ent. Fr. (1864) (4) **4**, 60.
Leptopsaltria quadrituberculata Stål, Berl. Ent. Ztschr. (1866) **10**, 170; Ö. V. A. F. (1870) 710; Dist., Mono. Orient. Cicadid. (1892) 31, *pl. 8, fig. 6, a, b.*

This fine species, described from Java by Signoret, has been found in China and also in the Philippines, having been taken by Semper. The most striking feature is the presence of the four ventral abdominal tubercles.

PALAWAN, Iwahig, P. I. (10889 *W. Schultze*), 2 ♂ specimens.

DUNDUBIA Amyot et Serville.

Hist. des Hém. (1834) 470.
Type: *D. mannifera* Linn.

4. DUNDUBIA MANNIFERA Linn.

Cicada mannifera Linn., Mus. Ad. Fried. (1754) 84, excl. syn.
Tettigonia vaginata Fabr., Mant. Ins. (1787) **2**, 266.
Cicada virescens Oliv., Encycl. Méth. (1790) **5**, 747.
Dundubia vaginata Am. et Serv., Hist. des Hém. (1843) 471; *varians* Walk., List Hom. (1850) **1**, 48; *immacula* Walk., ibid., 50; *nigrimacula* Walk., ibid., 63; *sobria* Walk., ibid., 63.
Cephaloxys terpsichore Walk., ibid., 239.
Fidicina confinis Walk., J. Linn. Soc., Zool. (1867) **10**, 92.
Dundubia mannifera Stål, Berl. Ent. Ztschr. (1866) **10**, 170; Ö. V. A. F. (1870) 707; Dist., Mono. Orient. Cicadid. (1892) **39**, *pl. 4, fig. 10, a, b;* Fauna British Ind., Rhyn. (1906) **3**, 94, *fig. 44*.
Mogannia terpsichore Atkins., J. A. S. B. (1885) **53**, 233.

This species is found over the entire East, as far north as China. It has been taken in Mindanao (6687, 7299 *Mrs. M. S. Clemens*) and on Sibuyan Island (2010 *R. C. McGregor*).

PALAWAN, Iwahig and Tara Island, P. I. (10893 *W. Schultze,* and 11722, 11972, 11978 *C. M. Weber*), 16 specimens.

COSMOPSALTRIA Stål.

Hem. Afr. (1866) **4**, 5.
Type: *C. doryca* Boisd.

5. COSMOPSALTRIA INERMIS Stål.

Cosmopsaltria inermis Stål, Ö. V. A. F. (1870) 708; Dist., Mono. Orient. Cicadid. (1892) 49, *pl. 6, fig. 15, a, b.*

This quite rare insect is very well figured by Distant. It has not been brought previously to this laboratory by any collector. Mr. Schultze was fortunate in securing a ♂ and a ♀ specimen.

PALAWAN, Iwahig, P. I. (10892 *W. Schultze*), 2 specimens.

Subf. GÆANINÆ.

Div. MOGANNIARIA.

MOGANNIA Amyot et Serville.

Hist. des. Hém. (1843) 467.
Type: *Mogañnia conica* Germ.

6. MOGANNIA CONICA Germ.
   - *Cicada conica* Germ., Thon's Arch. (1830) **2**, pt. 2, 39.
   - *Mogannia illustrata* Amy. et Serv., Hém. (1843) 467, *pl. 9, fig. 4*.
   - *Cephaloxys hemelytra* Sign., Ann. Soc. Ent. Fr. (1847) (2) **5**, 295.
   - *Mogannia indicans, ignifera et avicula* Walk., List Hom. (1850) **1**, 249, 250; (1852) **4**, *pl. 2, fig. 5*.
   - *Mogannia recta* Walk., List Hom., Suppl. (1858) 39.
   - *Mogannia conica* Stål, Ö. V. A. F. (1862) 483; Dist., Mono. Orient. Cicad. (1892) 122, *pl. 14, fig. 18, a, b*, Fauna British Ind., Rhyn. (1906) **3**, 152.
   - *Mogannia histrionica* Uhler, Proc. Acad. Nat. Sci. Philadelphia (1862), 283.
   - *Mogannia venutissima* Stål, Ö. V. A. F. (1865) 154.

PALAWAN, Bacuit, P. I. (11654 *C. M. Weber*), 1 specimen, which is the typical form. There is much variation in this species according to Distant *et al.*, although all the Philippine specimens appear to conform to the description of the typical form.

Subf. TIBICININÆ.

Div. HUECHYSARIA.

HUECHYS Amyot et Serville.

Hist. des Hém. (1843) 464.
Type: *H. sanguinea* De Geer.

7. HUECHYS SANGUINEA De Geer.
   - *Cicada sanguinea* De Geer, Mém. (1773) **3**, 221, *pl. 33, fig. 17*.
   - *Tettigonia sanguinolenta* Fabr., Syst. Ent. (1775) 681; Stoll, Pun. et Cig. (1788–1790) *fig. 62;* Fabr., Syst. Rhyng. (1803) 42.
   - *Cicada sanguinolenta* Oliv., Enc. Méth. (1790) **5**, 756.
   - *Huechys sanguinea* Amy. et Serv., Hist. des Hém. (1843) 465; Dist., Mono. Orient. Cicadid. (1892) 111, 112, Fauna British Ind., Rhyn. (1906) **3**, 157, *fig. 69*.

There is considerable variation in the color and markings of this species, but as all grades may often be seen in individuals of the same community, these should hardly be considered as even of varietal value. The insects lose their color in alcohol, the red changing to golden yellow, so that such specimens might even be considered as distinct species.

PALAWAN, Iwahig, P. I. (10955 *W. Schultze* and 11707 *C. M. Weber*), 140 specimens in many of which the mesonotum is nearly completely suffused with red.

Fam. FULGORIDÆ.

Subf. FULGORINÆ.

Div. APHANARIA.

APHÆNA[1] Guérin.

Voy. Bélang. Ind. Orient., Zool. (1834) 451.
Type: *A. farinosa* Weber.

8. APHÆNA FARINOSA Weber.[2]
   - *Cicada farinosa* Weber, Obs. Ent. (1801) 114.
   - *Lystra farinosa* Fabr., Syst. Rhyng. (1803) 57; Germ., Thon's Ent. Arch. (1830) pt. 2, 52.
   - *Aphana farinosa* Burm., Handb. der Ent. (1835) 2, pt. 1, 166; Stål, Stett. Ent. Zeit. (1863) 24, 232, Ö. V. A. F. (1870) 742; Atkins, J. A. S. B. (1885) 54, 142; Distant, Fauna British Ind., Rhyn. (1906) 3, 201.
   - *Aphæna farinosa* Spin., Ann. Soc. Ent. Fr. (1839) 8, 244; Walk., List Hom. (1851) 2, 274.
   - *Aphana scutellaris* White, Ann. Mag. Nat. Hist. (1846) 17, 330; Westw., Cab. Orient. Ent. (1848) 73, *pl. 36, fig. 3.*
   - *Aphaena saundersii* Walk., tom. cit. 277.

This species, known in India, Malay Peninsula, Java, Borneo and Sumatra, has been previously reported from the Philippines by Stål.

PALAWAN, Iwahig, P. I. (10957 *W. Schultze*), 2 specimens, which having been put into alcohol, show no white tomentum.

SCAMANDRA Stål.

Stett. Ent. Zeit. (1863) 24, 232.
Type: *S. rosea* Guér.

9. SCAMANDRA HERMIONE Stål.
   - *Scamandra hermione* Stål, Ann. Soc. Ent. Fr. (1864) (4) 4, 62, Ö. V. A. F. (1870) 743.

The specimen in my possession has a somewhat greater alar expanse than that designated by Stål for his type, it being 67 millimeters across. It is slightly longer also, its length being 21.5 mm.

PALAWAN, Iwahig, P. I. (10954 *W. Schultze*). A single specimen, agreeing perfectly with the description except as to size.

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[1] According to the rules of priority there is no doubt that Guérin's name should stand as he originally wrote it. There appears no special warrant for the change by Burmeister and much less for the following of his lead by modern entomologists. Spinola, in 1839, reverted to Guérin's name, with reason.

[2] Weber *not* Fabricius.

Subf. DICTYOPHARINÆ.

DICTYOPHORA Germar.

Silb. Rev. Ent. (1883) **1**, 175.
Type: *D. europæa* Linn.

10. DICTYOPHORA PALLIDA Don.
Fulgora pallida Don., Ins. Ind. (1800) **8**, *fig. 2.*
Fulgora graminea Fabr., Syst. Rhyng. (1803) 4.
Flatta lyrata Germ., Thon's Ent. Arch. (1830) (2) **2**, 47.
Pseudophana lyrata Burm., Handb. Ent. (1835) **2**, 160
Pseudophana pallida Westw., Tr. Linn. Soc. (1841) **18**, 150.
Dictyophora despecta Walk., List Hom. (1851) **2**, 314; Atkins, J. A. S. B. (1886) **55**, 27.
Dictyophora albivitta Walk., loc. cit. 319; Melich., Hom. Fauna Ceyl. (1903) 22.
Dictyophora lepthorina Walk., loc. cit. 321; Atkins, loc. cit. 30.
Dictyophora pallida Atkins, loc. cit. 27; Dist., Fauna British Ind., Rhyn. (1906) **3**, 243.
Dictyophora ?albivitta Atkins, loc. cit. 29.
Dictyophora percarinata Kirby, J. Linn. Soc., Zool. (1891) **24**, 134; Melich., loc. cit. 24.
Dictyophora hastata Melich., ibid. 25.

Kirkaldy[3] in his description of insects affecting sugar cane indicates an entirely different position and name for the insect described by Distant as cited above, and doubts the identity of *Fulgora pallida* Don., with the species above indicated.

There is certainly nothing in the essential structure of the insect under my hand which would ally it with *Zamila aberrans* Kirby. On the contrary, while Distant's figure of *Dictyophara* [sic] *lineata* Don., is extremely poor as to neuration of the tegmina, my specimen conforms closely to the figure of *Pibrocha egregia* Kirby, of a closely related genus, as given both by Kirby[4] and Distant.[5]

As to the term *Dictyophara,* I find the citation for Germar's genus in Agassiz's Nomenclator Zoologicus as *Dictyophora.* I have not Germar's original, but Kirkaldy states that Germar gave it *Dictyophora,*[6] and as Stål[7] gave it *Dictyophora,* I imagine that this change to *Dictyophara* is a typographical error which has been transmitted. Distant in his citations gives *Dictyophara percarinata* Kirby, whereas Kirby in his original description gives *Dictyophora percarinata.* I see no reason why the name should have been changed and agree with Kirkaldy's statement cited.

PALAWAN, Iwahig and Bacuit, P. I. (10973 *W. Schultze* and 11663

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[3] *Ann. Soc. Ent. Belg.* (1907), **51**, 123.
[4] Kirby, *J. Linn. Soc. Zool.* (1891), **24**, *pl. 5, fig. 4.*
[5] Distant, *Fauna British Ind., Rhyn.* (1906), **3**, 240, *fig. 104.*
[6] Kirkaldy, *loc. cit.* p. 124, footnote.
[7] Stål, *Hem. Fabr.* (1869), **2**, 91.

C. M. Weber). A single specimen of this insect was taken at each place. It is common in other parts of the Islands, but has not been reported previously.

CENTROMERIA Stål.

Ö. V. A. F. (1870) 745.
Type: *C. longipennis* Walk.

11. CENTROMERIA LONGIPENNIS Walk.
Centromeria longipennis Walk., List Hom. (1851) **2**, 316; Stål, Ö. V. A. F. (1870) 745; Dist., Fauna British Ind., Rhyn. (1906) **3**, 250, ref.

This species was originally described from the Philippines.

PALAWAN, Bintuan and Tara Island, P. I. (11691, 11712 *C. M. Weber*), 4 specimens, the single one from Tara Island somewhat mutilated and discolored.

Subf. ACHILINÆ.

FAVENTIA Stål.

Hem. Afr. (1866) **4**, 181.
Type: *F. pustulata* Walk.

12. FAVENTIA PUSTULATA Walk.
Cixius pustulatus Walk., J. Linn. Soc., Zool. (1856) **1**, 87.
Faventia pustulata Stål, Berl. Ent. Ztschr. (1866) **10**, 392; Dist., Fauna British Ind., Rhyn. (1906) **3**, 287, *fig. 135*.

This species has not been recorded hitherto from the Philippines. It is known from Tenasserim and Singapore.

PALAWAN, Iwahig, P. I. (10977 *W. Schultze*). A single specimen.

Subf. DERBINÆ.

PHENICE Westwood.

Tr. Linn. Soc. (1845) **19**, 10.
Type: *P. fritillaris* Westw.

13. PHENICE MOESTA Westw.
Derbe moesta Westw., Ann. Mag. Nat. Hist. (1851) (2) **7**, 209.
Phenice moesta Stål, Ö. V. A. F. (1870) 750; Atkins., J. A. S. B. (1886) **55**, 41; Melich., Hom. Fauna Ceyl. (1903) *54, pl. 2, fig. 11*.
Assamia dentata Buckt., Ind. Mus. Notes (1896) **4**, 1.

This insect is rather common on sugar cane in the Philippines at certain seasons of the year. It might eventually prove to be a serious pest.

PALAWAN, Iwahig, P. I. (10952 *W. Schultze*), 2 specimens.

JADA Distant.

Fauna British Ind., Rhyn. (1906) **3**, 299.
Type: *J. nitagalensis* Dist.

14. **Jada maculipennis** sp. nov. (Plate III, fig. 8.)

Fuliginous, facial carinæ slightly ferruginous; clypeus and rostrum sanguineous; second antennal segment yellowish, passing lower margin of eye; prothorax obscure brown-ochraceous; mesonotum glabrous medially; abdomen dull ochraceous dorsally and ventrally, segments with brown margins; genitalia slightly sanguineous.

Tegmina fuliginous, veins brown, except apical which are spotted with sanguineous; entire costal margin with pale ochraceous spots more or less confluent basally; a spot at angle of ultimate and penultimate branches of upper longitudinal vein;[8] two or three subcostal, subapical spots on costal vein and three pale spots on apex, the upper and lower with a brown point in its margin. Hind wings uniformly fuliginous with brown veins.

Length 3.5 millimeters, length of tegmina 9.5 millimeters.

PALAWAN, Tara Island, P. I. (*C. M. Weber* collector).

Type ♂ No. 11711 in Entomological Collection, Bureau of Science, Manila, P. I. A single specimen.

This species resembles *J. nitagalensis* Dist., in general pattern, but the wing maculation is quite different and the ♂ genitalia are not so markedly hooked as in Distant's species. The right hind wing of the type is mutilated, the left one has been removed from the specimen and mounted on a card attached to the same pin.

ZORAIDA Kirkaldy.

Entomologist (1900) 242 (*nom. nov.*)
Type: *Z. sinuosa* Westw.

15. ZORAIDA JAVANICA Westw.
Thracia javanica Westw., Tr. Linn. Soc. (1842) **19**, 19, *pl. 2, fig. 9;* Walk., List Hom. (1851) **2**, 400; Stål, Ö. V. A. F. (1870) 750.

This species is a true *Zoraida*. It has been taken at Montalban Gorge near Manila, but is not abundant.

PALAWAN, Iwahig, P. I. (12044 *C. M. Weber*). A single specimen, somewhat damaged.

Subf. LOPHOPINÆ.

SERIDA Walker.

J. Linn. Soc., Zool. (1857) **1**, 158.
Type: *S. latens* Walk.

16. SERIDA LATENS Walk.
Serida latens Walk., J. Linn. Soc., Zool. (1857) **1**, 158.
Lerida fervens id., loc. cit. pl. 7, fig. 8.[9]
Serida fervens Dist., Fauna British Ind., Rhyn. (1906) **3**, 325, *fig. 160.*

PALAWAN, Iwahig, P. I. (11900 *C. M. Weber*), 2 specimens.

The specimens from the Philippines agree with the description and figure in every particular, except that the markings are slightly paler and the tibiæ are somewhat ampliate, not prominently so, while Distant's figure shows absolutely no ampliation.

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[8] As indicated in Distant's description.

[9] Figured as *Lerida fervens* by Walker, probably in error or as an error of the artist.

ZAMILA Walker.

Journ. Ent. (1862) **1**, 304.
Type: *Z. lycoides* Walk.

17. ZAMILA PERPUSILLA Walk.
Pyrops perpusilla Walk., List Hom. (1851) **2**, 269.
Zamila perpusilla Dist., Fauna British Ind., Rhyn. (1906) **3**, 327.

PALAWAN, Iwahig, P. I. (10978 *W. Schultze*). A single specimen, which lacks the abdomen.

Originally described from India, this is the first record of this species for the Philippines.

JIVATMA Distant.

Fauna British Ind., Rhyn. (1906) **3**, 328.
Type: *J. metallica* Dist.

18. **Jivatma triangulata** sp. nov. (Plate III, fig. 5.)

Vertex, face and clypeus pale ochraceous, the face apically, transversely white, the clypeus with oblique, brown hair-lines and black apex; pronotum slightly darker; mesonotum brown between lateral carinæ and in lateral angles; all carinæ and margins slightly paler. Antennæ white, base of third segment beneath with a black spot.

Abdominal segments dorsally dark brown with cretaceous exudate at segmental articulations.

Tegmina brown, very dark in claval areas and with a triangular, hyaline area on middle of costa, its apex reaching disc of tegmen. Costal margin pale hyaline before and after triangular area with a series of about seven oblique brown lines crossing it and coalescing with brown of tegmen; beginning at proximal end of triangular area and extending to apex of the tegmen, a continuation of this series, consisting of about nine other brown, oblique lines, the first two short, the next five twice as long, the next or eighth a brown curved-sided triangle and the ninth like the 3–7. In the posterior apical angle a small dark brown spot, preceded anteriorly by a hyaline streak. Veins on the apical third pale brown. Wings fuliginous, veins black. Ventral surface ochraceous, more or less suffused with cretaceous; legs ochraceous, anterior femora with three pale brown annulations, anterior and mid tarsi with three, the apical being nearly black; spines of posterior tibiæ broadly black at their bases and with black tips; first tarsal segment more than twice length and breadth of remaining. Rostrum extends to posterior coxæ.

Length 6 millimeters. Length of tegmen 8.5 millimeters.

PALAWAN, Bintuan, P. I. (*C. M. Weber* collector).

Cotypes No. 11679 in Entomological Collection, Bureau of Science, Manila, P. I. Described from two specimens.

Subf. ISSINÆ.

HEMISPHÆRIUS Schaum.

Ersch & Gruber's Allg. Enc. Wiss. Künste (1850) **1**, 71.
Type: *H. coccinelloides* Burm.

19. **Hemisphærius parenthesis** sp. nov. (Plate III, fig. 3.)

Obovoidal, pale ochraceous with dark brown, transverse markings on the tegmina; head ochraceous, the margins diffusely sanguineous; eyes brown; ocelli rufous; clypeus pitchy brown, except basal portion which is ochraceous; pronotum concolorous with head and similarly margined; propleura black, as is also a broad band on anterior and mid coxæ; scutellum concolorous with head but not red-margined; tegmina convex, costal margin decidedly convex; the entire disc to claval and sutural margins, but excepting the costal and apical marginal areas which are ochraceous, dark chestnut brown with two transverse curved fasciæ, one anteriorly arched, across the middle of the tegmen, the other parenthesis-shaped on the apical third; these fasciæ do not attain the margins of the brown area on either side. The extreme external margin of the tegmen is slightly reflexed and is dark brown. Wings minute, translucent, brown apically, with yellow veins, pale basally.

Legs dark ochraceous; anterior and mid tibiæ with two brown annulations; those of the latter, which is externally sulcate, are not complete; apical spines to posterior tibiæ black, as is the single spine on apical third.

Basal ventral, abdominal segments dark brown, their margins ochraceous, apical segments dark ochraceous. Genitalia ochraceous; black apically.

Length, including tegmina, 3.7 millimeters, width 2.75 millimeters.

PALAWAN, Tara Island, P. I. (*C. M. Weber* collector).

Type ♀ No. 11720 in Entomological Collection, Bureau of Science, Manila, P. I.

Three other specimens, two from the same locality and one from Bintuan, P. I. (11697 *C. M. Weber*), labeled paratypes, are somewhat paler in color with the ochraceous color of the tegmina more diffuse. The specimen No. 11697 has the facial disc brown, its margins ochracous and mid coxæ somewhat broader.

20. **Hemisphærius transfasciatus** sp. nov. (Plate III, fig. 4.)

Obovoidal, pale brown, with three transverse yellow lines on tegmina.

Head, pronotum and scutellum pale ochraceous, all margined with ferrugineous; face slightly darker on disc; clypeus and rostrum black, glabrous; former pale yellow basally. Tegmina pale brown with a transverse basal interrupted yellow fascia, another, sinuate, on basal third from near internal suture externad for two-thirds width of tegmen, and a third, crescentic, across apical third not attaining either margin; wings fuliginous apically, with white veins, yellow basally.

Abdominal segments dorsally, ochraceous, narrowly red-margined, ventrally obsolescently brown, widely yellow-margined; genitalia brown.

Legs ochraceous, apices of anterior and mid femora and two annulations on anterior and mid tibiæ dark brown, posterior tibiæ dark ochraceous; tibial spine on apical third not conspicuous, black, as are the apical and subapical.

Length 3.75 millimeters, width 2.75 millimeters.

PALAWAN, Iwahig, P. I. (*W. Schultze* collector).

Type ♂ No. 11961 in Entomological Collection, Bureau of Science, Manila, P. I. Described from a single specimen.

While this species might be taken for the ♂ of *H. parenthesis* at first sight, the pleural and coxal markings together with the entirely different pattern of the tegminal markings will at once aid in differentiating it.

21. **Hemisphærius trimaculatus** sp. nov. (Plate III, fig. 1.)

Obovoidal, brown, with ochraceous spots on tegmina. Occiput dark ochraceous, face brown except at union with clypeus, where it is pale ochraceous; clypeus and rostrum black, glabrous, base pale ochraceous, medially prominent; eyes brown, narrowly pale-margined; pronotum pale yellow, red-margined; scutellum brown, margins rufous; pleuræ pale yellow with a longitudinal dark brown stripe on pro- and mesopleuræ; anterior and mid coxæ pale yellow, each with a broad, black median band. Tegmina brown, pale-margined and with three irregular, pale, ochraceous spots, one on basal third and two across apical third; wings black, the veins and basal areas yellow. Abdominal segments dorsally brown with sanguineous margins, ventrally with yellow margins. Genitalia yellow, brown at apices of lobes. Legs ochraceous; fore and mid tibiæ with two brown annulations, the subbasal obsolescent. Posterior tibiæ apically black, with a subapical black-tipped spine and another on apical third.

Length 3.75 millimeters, width 2.75 millimeters.

PALAWAN, Iwahig, P. I. (*W. Schultze* collector).

Type ♀ No. 10962 in Entomological Collection, Bureau of Science, Manila, P. I. Described from a single specimen.

22. **Hemisphærius ståli** sp. nov. (Plate III, fig. 2.)

Obovoid, ochraceous and red, with three longitudinal red lines on face, and basal half of tegmina brown.

Head deep yellow; face margined with vermilion and with a broad, median, vermilion, longitudinal line which, together with marginal red, terminates at base of clypeus which is uniformly yellow except apical half and rostrum which are pitchy black. Occiput yellow, red-margined; eyes brown with paler margins. Pronotum lens-shaped, the anterior margin slightly more convex than the posterior and both with vermilion margins; scutellum equilateral, yellow, with vermilion margins of which the lateral are quite narrow and a median vermilion fascia from anterior margin halfway to apex. Tegmina ochraceous, basal half dark, pitchy brown except tumeral angles which are paler and internal sutures which are broadly yellow, margined with red to apex of claval region. Wings exceedingly small, not measuring a millimeter in length, and of a pale ocher.

Abdominal segments dorsally ochraceous, obsoletely red-margined, ventrally brown with pale ochraceous margins.

Legs ochraceous; apices of tibiæ black. Apices of tarsi brown. Posterior tibial spines black-tipped.

Length 4.5 millimeters; width 3.4 millimeters.

PALAWAN, Mount Kapuas, P. I. (*C. M. Weber* collector).

Type No. 12399 in Entomological Collection, Bureau of Science, Manila, P. I. Described from a single specimen in perfect condition.

Somewhat like *H. reticulatus* Dist., in general pattern, but differing decidedly in color and facial marking.

Dedicated to the memory of Dr. Carolus Stål.

Subf. RICANIINÆ.

Div. RICANIINARIA.

POCHAZIA Amyot et Serville.

Hist. des Hém. (1843) 528.
Type: *P. fasciata* Fabr.

23. Pochazia guttifera Walk.
Pochazia guttifera Walk., List. Hom. (1851) **2**, 427; Melich., Ann. Hoffm. Wien. (1898) **13**, 216, *pl. 9, fig. 22*, Hom. Fauna Ceyl. (1903) 83; Dist., Fauna British Ind., Rhyn. (1906) **3**, 374.
Ricania guttifera Stål, Ö. V. A. F. (1862) 491; Atkins., J. A. S. B. (1886) **55**, 57.

This species, described by Walker from Silhet, and known also in Darjiling and Tenasserim, has not been reported before from the Philippines.

Palawan, Iwahig, P. I. (10972 *W. Schultze*). A single somewhat dilapidated specimen was taken.

RICANIA Germar.

Mag. Ent. (1818) **3**, 221.
Type: *R. fenestrata* Fabr.

24. Ricania speculum Walk.
Flatoides speculum Walk., List. Hom. (1851) **2**, 406.
Flatoides tenebrosus et perforatus, Ibid., pp. 406 and 407.
Ricania malaya, Stål, Ö. V. A. F. (1854) 247.
Ricania speculum Stål, loc. cit. (1870) 765; Atkins., J. A. S. B. (1886) **55**, 54; Melich., (part) Ann. Hoffm. Wien. (1898) **13**; 223; Dist., Fauna British Ind., Rhyn. (1906) **3**, 377.

A well-known species in the Philippines. There is a slight variation in the piceous markings of the apical clear spots and of the costal spots as to coalition.

Palawan, Bacuit, P I. (11673 *C. M. Weber*), 3 specimens.

25. Ricania subsinuata Stål.
Ricania subsinuata Stål. Ö. V. A. F. (1870) 768.

Palawan, Iwahig, P. I. (10965 *W. Schultze*), 2 specimens.

This species has two costal transparent spots, another at the apical angle and two on the apical margin, but it also has what Stål calls "albido-hyaline" spots or areas over the whole tegmen, or "corium" as he demonstrates it, in his description, *q. v.*

26. Ricania tæniata Stål.
Ricania tæniata Stål, Ö. V. A. F. (1870) 766.

Palawan, Iwahig, P. I. (10971 *W. Schultze* and 11982 *C. M. Weber*), 4 specimens. This species is easily distinguishable by the broad, medial, dark band on the tegmina and the absence of the spot at the exterior apical angle.

27. RICANIA FUMOSA Walk.

Flatoides fumosus Walk., List. Hom. (1851) **2**, 414.

Ricania proxima Melich., Ann. Hoffm. Wien. (1898) **13**, 226, *pl. 11, fig. 22.*

Ricania fumosa Stål, Ö. V. A. F. (1862) 491; Atkins., J. A. S. B. (1886) **55**, 55; Melich., loc. cit. p. 230; Dist., Fauna British Ind., Rhyn. (1906) **3**, 382.

This species has been collected in Sumatra, Siam, Assam, Java, and Celebes, but has not been recorded previously from the Philippines.

PALAWAN, Iwahig, P. I. (10970 *W. Schultze*), 7 specimens. The chief point of difference between this species and *R. tæniata* is that the apex of the tegmen in *tæniata* is more acute than in *fumosa.*

Subf. FLATINÆ.

Div. CERYNIARIA.

CERYNIA Stål.

Rio Jan. Hem. (1862) **2**, 68.
Type: *C. albata* Stål.

28. CERYNIA MARIA White.

Pœciloptera maria White, Ann. Mag. Nat. Hist. (1846) **18**, 25, *pl. 1, fig. 3.*

Flatta maria Walk., List. Hom. (1851) **2**, 436.

Flatta completa Ibid. p. 436.

Flatta tenella Ibid. p. 437.

Cerynia lutescens Melich., Ann. Hoffm. Wien. (1901) **16**, 220.

Cerynia maria Stål, Ö. V. A. F. (1862) 490; Dist., J. A. S. B. (1879) **48**, 38, Ann. Mag. Nat. Hist. (1883) (5) **11**, 172; Atkins., J. A. S. B. (1886) **55**, 64; Dist., Fauna British Ind., Rhyn. (1906) **3**, 408, *fig. 210.*

This beautiful insect has never before been recorded from the Philippines. It was described by White from Silhet, India, and it has been taken outside of India only in west China and Sumatra (*fide Melichar*). The Philippine specimens have the subbasal spot on the tegmina more luteo-chraceous.

PALAWAN, Iwahig, P. I. (10980 *W. Schultze*), 2 specimens.

SALURNIS Stål.

Ö. V. A. F. (1870) 773.
Type: *S. granulosa* Stål.

29. SALURNIS GRANULOSA Stål.

Salurnis granulosa Stål, Ö. V. A. F. (1870) 774.

This species, the type of the genus, was originally described from the Philippine Islands. Since the time of its first description it has apparently not been taken previous to the present record. A species somewhat similar was taken in Manila in 1905, but I have, as yet, not placed it positively. This second species was identified by Distant as *S. granulosa,* but certainly does not conform with Stål's description, either generically or specifically.

PALAWAN, Iwahig, P. I. (10979 *W. Schultze*). A single well-marked specimen.

NEPHESA Amyot et Serville.

Hist. des Hém. (1843) 527.
Type: *N. rosea* Spin.

30. NEPHESA ROSEA Spin.

Ricania rosea Spin., Ann. Soc. Ent. Fr. (1839) **8**, 400.
Nephesa rosea Amy. et Serv., Hist. des Hém. (1843) 528; Walk., List Hom. (1851) **2**, 433; Stål, Ö V. A. F. (1870) 773.

PALAWAN, Iwahig, P. I. (10981 *W. Schultze*), 32 specimens. There is considerable variation in this species as to color, the tints ranging from pale green through yellow and white to rose. Some of the green specimens have the tegmina bordered with yellow-orange. Found by Schultze on cacao (*Theobroma cacao* Linn.).

DÆDA gen. nov.

Type: **Dæda puncticlava** sp. nov.

Head, including eyes, somewhat narrower than pronotum; vertex one-third as long as its width, anterior margin (viewed from dorsad) straight, obtusely angulate medially, laterally carinate and slightly laminate before eyes; ocelli widely separate, their distance from eyes one-fifth their interspace. Face confluent with vertex, as broad as long, lateral margins convex and carinate apically; submedian area broadly foveate before clypeus; median carination strongly tumescent ventrad to juncture of face and vertex, less elevate toward clypeus, which is separated from face by profound transverse sulcus; rostrum just passes mid coxæ.

Pronotum slightly longer than head, its anterior margin convex and in line with middle of eyes, its posterior margin evenly concave. Mesonotum three times length of pronotum, its disc evenly convex and medially *sulcate,* its posterior medial angle tumescent-tuberculate.

Tegmina twice as long as wide, costal margin arched at base; costal area twice width of radial and with parallel and reticulated oblique veins and sparse granulations. Radial area with cross-veins on posterior third. Outer half of disc with reticulated parallel veins, apical area beyond transverse line with most of veins furcate; entire clavus, interiad to its exterior vein, strongly granulate, the granulations disposed in parallel lines. Posterior tibiæ with two subapical spines.

Most closely resembles *Ketumala* Dist., from which, however, it differs in the shape of the tegmina, the tumescent facial carination, the number of spines on the posterior tibiæ and the position of the transverse preapical tegminal line.

It differs from all other related genera in the presence of the mesonotal sulcation.

31. Dæda puncticlava sp. nov. (Plate III, fig. 6.)

Compactly ovate, the tegmina compressed so that their apical margins are vertical; dark ochraceous, the posterior apical region of the tegmina fuscous.

Head, pro- and mesonota pale ochraceous, glabrous, eyes brown, ocelli vitreous; clypeus sparsely pubescent; tegmina olivaceo-fuscous apically, pale ochraceous basally; clavus with an oval, black foveate puncture at apical third between longitudinal veins. Legs pale ochraceous.

Length 4 millimeters, including tegmina 7 millimeters; length of tegmen 6 millimeters.

PALAWAN, Tara Island, P. I. (*C. M. Weber* collector).

Type No. 11719 in Entomological Collection, Bureau of Science, Manila, P. I. Described from a single specimen.

Div. FLATOIDESARIA.

UXANTIS Stål.

Ö. V. A. F. (1870) 775.
Type: *U. consputa* Stål.

32. UXANTIS SICCIFOLIA Stål.
Uxantis siccifolia Stål, Ö. V. A. F. (1870) 776.

This species, of which Stål possessed only the ♂, is fairly common in Manila. It may usually be taken on *Casuarina equisetifolia* Forst.

PALAWAN, Bacuit, P. I. (11672 *C. M. Weber*), 1 specimen.

Fam. MEMBRACIDÆ.

Subf. CENTROTINÆ.

Div. MICREUNARIA.

LEPTOBELUS Stål.

Hem. Afr. (1866) 4, 86.
Type: *L. dama* Germ.

33. LEPTOBELUS DAMA Germ.
Centrotus dama Germ., Silb. Rev. Ent. (1835) **3**, 258; Fairm., Ann. Soc. Ent. Fr. (1840) **4**, 510, *pl. 3, fig. 14*.
Leptobelus dama Stål, Berl. Ent. Ztschr. (1866) **27**, 386; Atkins., J. A. S. B. (1885) **54**, 81; Dist., Fauna British Ind., Rhyn. (1908) **4**, 15, *fig. 11*.

This is the first record of this species from the Philippine Islands.

PALAWAN, Tara Island, P. I. (11715 *C. M. Weber*), 2 specimens, one having the corneous processes broken.

Div. LEPTOCENTRARIA.

LEPTOCENTRUS Stål.

Hem. Afr. (1866) **4,** 87 and 90.
Type: *L. bos* Sign.

34. LEPTOCENTRUS TAURUS Fabr.
Membracis taurus Fabr., Syst. Ent. (1775) 676; Oliv., Enc. Méth. (1792) 665.
Membracis rupicapra Fabr., Ent. Syst. Suppl. (1798) 514.
Centrotus rupicapra Id., Syst. Rhyng. (1803) 18.
Centrotus taurus Ibid., p. 20.
Membracis tricornis Hardw., Zool. Journ. (1828) **4,** 114, Suppl. *pl. 30, figs. c, d, f.*
Centrotus terminalis Walk., List. Hom. (1851) **2,** 604; Stål, Ö. V. A. F. (1862) 491; Melich., Hom. Fauna Ceyl. (1903) 109.
Centrotus vicarius Walk., loc. cit., p. 605.
Leptocentrus taurus Stål, Hem. Fabr. (1869) **2,** 50; Atkins., J. A. S. B. (1885) **54,** 85; Dist., Fauna British Ind., Rhyn. (1908) **4,** 28, *fig. 24.*
Leptocentrus gazella Buckt., Mono. Membrac. (1903) 235, *pl. 53, fig. 5a.*

I am inclined to believe that the species heretofore called *L. reponens* Walk. and *L. antilope* Stål are the same as the above, the only difference indicated by Distant being a slightly greater anterior foliation of the transverse processes of the pronotum.

PALAWAN, Bacuit, Bintuan, and Iwahig, P. I. (11669, 11690, 11924 *C. M. Weber*), 5 specimens.

Div. GARGARARIA.

GARGARA Amyot et Serville.

Hist. des Hém. (1843) 537.
Type: *G. genistæ* Fabr.

53. GARGARA PYGMÆA Walk.
Centrotus pygmæus Walk., List Hom. (1851) **2,** 630.

This minute species, described originally from the Philippines and, apparently, not noted since its description, may be distinguished from its allies by the albescent apices of the tegmina.

PALAWAN, Bacuit and Iwahig, P. I. (11668, 11925 *C. M. Weber*), 3 specimens.

Fam. CERCOPIDÆ.

Subf. MACHÆROTINÆ.

MACHÆROTA Burmeister.

Handb. der Ent. (1835) 2, pt. 1, 128.
Type: *M. ensifera* Burm.

36. MACHÆROTA ENSIFERA Burm.
Machærota ensifera Burm., Handb. der Ent. (1835) 2, pt. 1, 128; Stål, Ö. V. A. F. (1870) 727; Sign., Ann. Soc. Ent. Fr., Bull. (1879) (5) 9, xlviii; Atkins., J. A. S. B. (1885) 54, 22; Dist., Fauna British Ind., Rhyn. (1908) 4, 80, *fig. 65*.

An abundant species in the Philippines. It builds its calcareous, tube-like nests on shrubs of *Sida acuta* Burm., and all the stages of its development may be easily observed.

PALAWAN, Iwahig, P. I. (11928 *C. M. Weber*). A single specimen.

Subf. APHROPHORINÆ.

CLOVIA Stål.

Hem. Afr. (1866) 4, 75.
Type: *C. bigoti* Sign.

37. CLOVIA CONIFER Walk.
Ptyelus conifer Walk., List Hom. (1851) 3, 711.
Ptyelus simulans Ibid. p. 717.
Ptyelus frenulatus Stål, Ö. V. A. F. (1854) 250; Freg. Eug. Resa, Ins. (1859) 286, Ö. V. A. F. (1862) 493.
Clovia frenulata Stål, loc. cit. (1870) 726.
Clovia conifer Atkins., J. A. S. B. (1885) 54, 114; Dist., Fauna British Ind., Rhyn. (1904) 4, 93, *fig. 72*.

This species, though reported previously from the Philippines, has not, up to this time, appeared in our collection.

PALAWAN, Iwahig, P. I. (10964 *W. Schultze* and 11930 *C. M. Weber*), 2 specimens.

MANDESA Distant.

Fauna British Ind., Rhyn. (1908) 4, 106.
Type: *M. amplificata* Dist.

38. MANDESA VITTIFRONS Stål. (Plate III, fig. 7 ♂.)
Clovia vittifrons Stål, Ö. V. A. F. (1870) 725.

In this species, which is undoubtedly referable to this genus, the discal transverse raised ridge mentioned by Distant in his generic diagnosis crosses only the inner two-thirds of the tegmina but the other characters are not to be mistaken. The ♀ is considerably larger than the ♂ and is more pallid with all dark markings less pronounced.

In the specimens before me the measurements are as follows: ♂ length

7 millimeters, width at widest portion of tegmina 3.25 millimeters, ♀ length 8.25–9.25 millimeters, width 3.75 millimeters.

Thus far known only from the Philippines.

PALAWAN, Iwahig, P. I. (10963 *W. Schultze* and 11981 *C. M. Weber*); Tara Island (11713 *C. M. Weber*), 5 specimens.

Subf. CERCOPINÆ.

COSMOSCARTA Stål.

Hem. Fabr. (1869) **2,** 11.
Type: *C. heros* Fabr.

39. COSMOSCARTA INCLUSA Walk.
Cercopis inclusa Walk., List Hom. (1851) **3,** 658; Stål, Ö. V. A. F. (1865) 147.
Cosmoscarta inclusa Butl., Cist. Ent. (1874) **1,** 265; Melich., Hom. Fauna Ceyl. (1903) 125, *pl. 4, fig. 5;* Dist., Fauna British Ind., Rhyn. (1908) **4,** 140.

This species, originally described from Ceylon and not thus far reported from any other locality, is here recorded from the Philippines for the first time.

PALAWAN, Iwahig, P. I. (11973 *C. M. Weber*), 2 specimens.

Fam. JASSIDÆ.

Subf. LEDRINÆ.

PETALOCEPHALA Stål.

Ö. V. A. F. (1853) 266.
Type: *P. bohemani* Stål.

40. PETALOCEPHALA PHILIPPINA Stål.
Petalocephala philippina Stål, Ö. V. A. F. (1870) 732.

PALAWAN, Iwahig, P. I. (10982 *W. Schultze*), 1 specimen.

Subf. TETTIGONIELLINÆ.

TETTIGONIELLA Jacobi.

Zool. Jahr. Syst. (1904) **19,** 778 (nom. nov.)
Type: *T. viridis* Linn.

41. TETTIGONIELLA IMPUDICA Sign.
Tettigonia impudica Sign., Ann. Soc. Ent. Fr. (1853) (3) **1,** 677.
Tettigonia impudica? Stål, Ö. V. A. F. (1870) 733.

This species was originally described from the Philippines in Signoret's monograph.

PALAWAN, Iwahig and Tara Island, P. I. (10974 *W. Schultze*, 11714 *C. M. Weber*), 5 specimens.

KOLLA Distant.

Fauna British Ind., Rhyn. (1908) **4**, 223.
Type: *K. insignis* Dist.

42. **Kolla tripunctifrons** sp. nov.

Head and pronotum more or less pale ochraceous; tegmina albescent, semiopaque, apical veins fuscous. Two black spots on anterior margin and another before middle of vertex. Eyes black. Ventral surface of body slightly virescent white. Legs very pale ochraceous or nearly white, tarsi slightly darker.

Length, including tegmina, 8 millimeters; width 2 millimeters.

PALAWAN, Iwahig, P. I. (*W. Schultze* collector).

Type No. 10976 in Entomological Collection, Bureau of Science, Manila, P. I. Another specimen taken by Weber at the same place (11702 *C. M. Weber*) is 10 millimeters long and 2.25 millimeters wide but is otherwise identical with the type.

Subf. JASSINÆ.

Div. TARTESSUSARIA.

TARTESSUS Stål.

Ö. V. A. F. (1865) 156.
Type: *T. ferrugineus* Walk.

43. TARTESSUS FERRUGINEUS Walk.

Bythoscopus ferrugineus Walk., List Hom. (1851) **3**, 865.
Bythoscopus malayus Stål, Freg. Eug. Resa, Ins. (1859) 290.
Bythoscopus biarcuatus, unilineatus, unifascia, Walk., MS.
Tartessus malayus Stål, Ö. V. A. F. (1865) 156; Sign., Ann. Soc. Ent. Fr. (1880) (5) **10**, 357.
Tartessus ferrugineus Stål, loc. cit. (1870) 738; Spangb., loc. cit. (1877) 7; Sign., ibid. 356; Dist., Fauna British Ind., Rhyn. (1908) **4**, 303, *fig. 193*.

This species appears to be quite well distributed over the oriental region as far north as Japan. It has been taken frequently in the Philippines.

PALAWAN, Bacuit and Bintuan, P. I. (11657, 11680 *C. M. Weber*), 2 specimens.

44. TARTESSUS FIEBERI Stål.

Tartessus fieberi Stål, Ö. V. A. F. (1865) 156, loc. cit. (1870) 738.

PALAWAN, Bacuit, P. I. (11708 *C. M. Weber*) a single specimen.

Div. JASSUSARIA.

JASSUS Fabricius.

Syst. Rhyng. (1803) 85.
Type: *J. nervosus* Fabr.

45. JASSUS ELEGANS Dist.
Jassus elegans Dist., Fauna British Ind., Rhyn. (1908) 4, 329.

PALAWAN, Iwahig, P. I. (10960 *W. Schultze*), 1 specimen.

This species, described from India, is here recorded from the Philippines for the first time.

ERRATA.

The following corrections should be made in Part I of Rhynchota Palawanica, Vol. IV, Sec. A, 553.

Page 557, in middle of page, for **Coscomoris** read **Cosmocoris.**

Page 562, line 16, a period follows Amy.

Page 564, line 1, for **Tessaratominiæ** read **Tessaratominæ**

Page 564, page 11, from bottom of page, for ———— **Stål** read **Eumenotes obscura Stål.**

Page 565, above Subf. **COREINÆ** insert Fam. **COREIDÆ.**

Page 572, line 15, delete comma after **British.**

Page 584, line 3, and page 588, line 12, for **and** read **&.**

Page 593, line 11, for **anadymone** read **anadyomene.**

ILLUSTRATIONS.

PLATE III.

FIG. 1. Hemisphærius trimaculatus Banks, sp. nov.
2. Hemisphærius ståli Banks, sp. nov.
3. Hemisphærius parenthesis Banks, sp. nov.
4. Hemisphærius transfasciatus Banks, sp. nov.
5. Jivatma triangulata Banks, sp. nov.
6. Dæda puncticlava Banks, gen. et sp. nov.
7. Mandesa vittifrons Stål.
8. Jada maculipennis Banks, sp. nov.

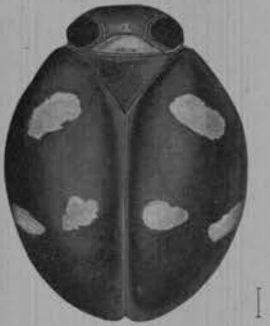

FIG. 1

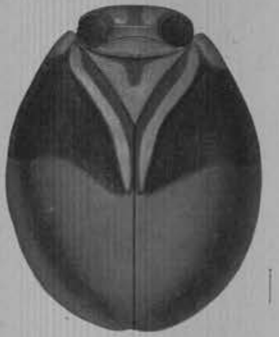

FIG. 2

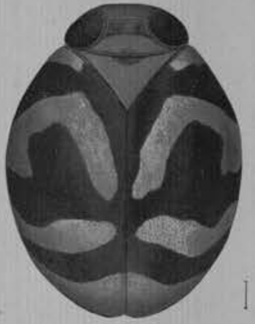

FIG. 3

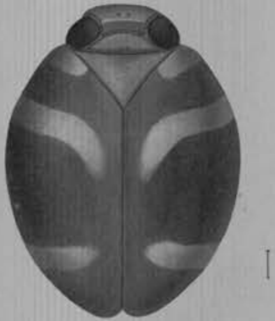

FIG. 4

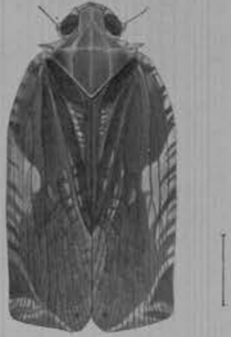

FIG. 5

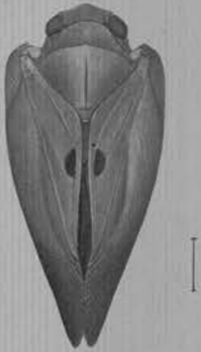

FIG. 6

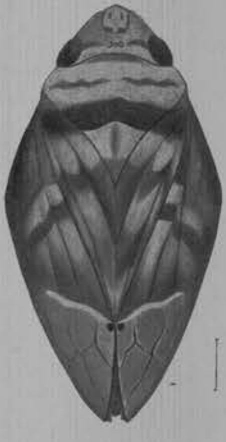

FIG. 7

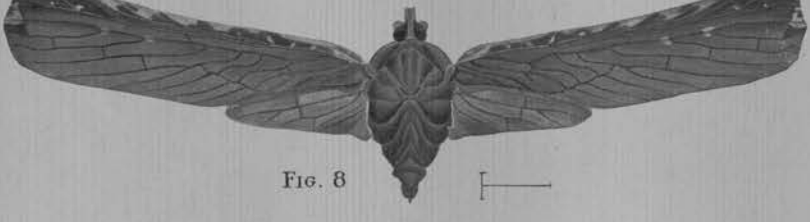

FIG. 8

W. Schultze and J. Castro, ad nat. del. 1910.

PLATE III.

RHYNCHOTA PHILIPPINENSIA, PART I.

By W. L. Distant.
(*London and Norwood Junction, England.*)

When visiting London in 1908, Mr. Charles S. Banks, the Government Entomologist at Manila, brought a collection of Rhynchota for determination. This collection contained the following apparently undescribed species, and three others which have been described elsewhere, viz:

Macropes philippinensis Dist., *Rec. Ind. Mus.* (1909) 3, 165, *Pl. 11, fig.* 7, *a.* (Lygæidæ)

Catara philippinensis Dist., *loc. cit.* 172, *Pl. 11, fig. 12, a.* (Fulgoridæ)

Rihana atra Dist., *Entomologist* (1909) 207. (Cicadidæ)

There was also a number of species not enumerated in Stål's "Hemiptera Insularum Philippinarum," but these will be included in a complete list of the known species when more material has accumulated. These Islands probably contain a very exclusive Rhynchotal fauna.

Order RHYNCHOTA.

Suborder HETEROPTERA.

Family PENTATOMIDÆ.

CANTAO Amyot et Serville.

Hém. (1843) 29.
Type: *C. ocellatus* Thunb.

Cantao intermedius sp. nov.

Dull brownish ochraceous; basal area of head centrally continued along middle lobe, but not reaching apex, bluish black; pronotum usually with six small black spots arranged transversely in three pairs, of which those of the middle pair are usually closer together than the others; scutellum with eight black spots, two basal, two on each lateral area (one before, the other beyond middle) and two central (one near base, the other near apex); sternum and legs bluish black; lateral margins of sternum and abdomen beneath ochraceous; the latter with marginal and a double series of central bluish black spots; antennæ black, second joint very slightly longer than first, third, fourth and fifth subequal in length; rostrum black and reaching the base of the third abdominal segment; pronotum thickly, finely punctate, except on anterior marginal area, the lateral margins nearly obliquely straight, the lateral angles broadly subacute and subprominent; scutellum thickly, finely punctate, except on basal area, with a central, longitudinal carination neither reaching base nor apex.

Long. incl. tegm. 17–19 millimeters, Exp. pronot. angl. 9–9.5 millimeters.

Hab. Philippine Islands; Batan Island (*R. C. McGregor* collector).

Separated from *C. ocellatus* Thunb., and allied to *C. rufipes* Dall., by the length of the rostrum. From *C. rufipes* it is to be distinguished by the more oblique and less sinuate lateral margins of the pronotum, the lateral angles of which are also much more obtuse; the scutellum is broader and somewhat shorter; color different; from both species it differs by having the posterior lateral spots to the scutellum transverse and not oblique.

PEGALA Stål.

Öfv. Vet-Ak. Förh. (1867) 522.
Type: *P. biguttula* Hagl.

Pegala clemensæ sp. nov. (Plate I, fig. 2.)

Head, pronotum and scutellum pale ochraceous; head with the lateral margins and the anterior lateral margins of the central lobe, black; pronotum with the posterior margin (broadly) and the margins of the lateral angles (narrowly) castaneous; scutellum with the basal half (in type) sordidly pale ochraceous; corium castaneous brown, with a pale ochraceous subcostal spot behind middle; membrane hyaline with a transverse pale fuscous fascia behind middle; body beneath and legs pale luteous, two black spots on each side of mesosternum and one on each side of metasternum, anal processes more or less castaneous; legs minutely spotted with piceous; first, second and third joints of antennæ ochraceous with their apices piceous, fourth and fifth joints piceous, third joint longer than second, third, fourth and fifth almost subequal in length; pronotum sparsely, brownly punctate on central disk, the castaneous posterior margin more thickly punctate; scutellum sparsely punctate, on posterior area centrally longitudinally sulcate, an elongate marginal castaneous spot on each side beyond middle; corium thickly, coarsely punctate; rostrum about reaching the posterior coxæ, its apex and the upper surface of second and third joints piceous; mesosternal laminate carination continued before the anterior margin of the prosternum; apex of scutellum obtusely angulate; posterior pronotal angles not prominent; posterior angles of the sixth abdominal segment spinously produced.

Long. 9 millimeters, Exp. pronot. angl. 5.5 millimeters.

Hab. Philippine Islands; Mindanao, Camp Keithley (*Mrs. M. S. Clemens* collector).

Allied in general form and appearance to *P. melaphæa* Walk., but pronotum and scutellum much less punctate; corium paler with pale ochraceous subcostal spot, antennæ with the first three joints pale, with their apices piceous; rostrum shorter, etc.

Family LYGÆIDÆ.

PACHYGRONTHA Germar.

Silb. Rev. Ent. (1837) 5, 152.
Type: *P. lineata* Germ.

Pachygrontha nigrolineata sp. nov. (Plate I, fig. 3.)

Ochraceous, somewhat thickly, coarsely and darkly punctate; pronotum with the extreme lateral margins pale ochraceous and levigate preceded by a submarginal fascia formed by black punctures on each side; a longitudinal black fascia on each corium commencing near middle of clavus and continued on membrane to about one-fourth before apex where it is obliquely deflected to margin by a broken continuation; apical fourth of membrane exhibiting a central black longitudinal line probably a reflection from the abdomen beneath it and with two small piceous spots on apical margin, the membrane between the black longitudinal lines distinctly paler in color; head beneath and sternum brownish grey, thickly darkly punctate; abdomen beneath pale ochraceous, with a sublateral fascia on each side and a central fascia on the last two segments piceous brown; stigmatal spots black; legs ochraceous, somewhat thickly speckled with piceous, anterior femora, above, more prominently speckled with black; antennæ with the first and second joints subequal in length, apex of first joint moderately thickened and piceous, third shorter than second, fourth mutilated in type; head, including eyes, about as broad as anterior margin of pronotum, anteriorly shortly, spinously produced on each side; pronotum scarcely or but little longer than broad at base, more thickly punctate on lateral areas than on middle area; scutellum with a central pale levigate line and a small pale spot near each basal angle; corium with the extreme lateral margin levigate, except on basal fourth where it is punctate; clavus longitudinally punctate; anterior femora somewhat strongly spined beneath, anterior tibiæ curved.

Long. 12 millimeters.
Hab. Philippine Islands; Manila (*Charles S. Banks* collector).

Family TINGIDIDÆ.

HORMISDAS gen. nov.

Type: **H. pictus** sp. nov.

Head with seven porrect spines of which three are apical, the central one considerably the longest, a shorter and more robust spine on each side between eyes and base of antennæ and two long spines extending from base of head to about base of antennæ; antennæ long, distinctly pilose, first and second joints short, robust, second shorter than first and more globose, third slightly more than twice as long as fourth; rostrum reaching the intermediate coxæ; pronotum longer than broad, continuously tricarinate, the lateral margins ampliate, bi-areolate and longly, porrectly spined at the anterior angles; scutellum concealed; elytra elongate, concavely sinuate on costal margin beyond middle, the apex a little widened and rounded, discoidal area small, about as long as pronotum, subcostal area with a single series of areolets, costal area bi-areolate, the areolets and those on sutural area somewhat large and prominent; mesosternum with two longitudinal central ridges between which the rostrum is enclosed; legs slender.

This genus has a superficial resemblance to *Hædus* Dist., from South Africa, but its real affinity is with the Ceylonese genus *Celantia* Dist.

Hormisdas pictus sp. nov. (Plate I, fig. 1, *a*, *b*.)

Head, antennæ and pronotum pale fuscous brown, the latter with the ampliated lateral margins hyaline, with the edges of the areolets pale brownish; elytra with the discoidal and sutural areas pale fuscous, the disks of the first and the margins of the latter piceous, the narrow subcostal area greyish brown and the costal area hyaline with the edges of the areolets pale brownish; body beneath piceous brown; legs pale greyish; structural characters as in generic diagnosis.

Long. 3.5 millimeters.

Hab. Philippine Islands; Manila (*Charles S. Banks* collector).

Family HEBRIDÆ.

MERRAGATA Buchanan White.

Ann. Mag. Nat. Hist. (1877) (4) **20**, 113.
Type: *M. hebroides* White.

Merragata cruciata sp. nov. (Plate I, fig. 7.)

Head, pronotum and scutellum black, somewhat palely, finely pilose; anterior margin of pronotum piceous brown; corium brownish ochraceous, the apical margin paler; membrane piceous, almost completely crossed each way by a large cruciform pale ochraceous fascia; body beneath black, legs, antennæ and rostrum ochraceous; antennæ five-jointed, first joint a little longer than second, third a little longer than either fourth or fifth, the latter (excluding base) a little darker in hue; pronotum with the posterior angles a little tuberculately prominent; scutellum with the apex broadly, angularly incised.

Long 2.33 millimeters.

Hab. Philippine Islands; Rizal, Montalban Gorge (*Charles S. Banks* collector).

Family REDUVIIDÆ.

ACANTHASPIS Amyot et Serville.

Hém. (1843) 336.
Type: *A. flavovaria* Hahn.

ACANTHASPIS DISTANTI[1] Banks. (Plate I, fig. 12.)

Acanthaspis distanti Banks, *This Journal*, Sec. A (1909), 4, 584.

Hab. Philippine Islands, Bohol (*A. Celestino* collector). Sibuyan Island (*R. C. McGregor* collector).

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[1] At the time of the receipt of this MS. from Mr. Distant, a paper of my own containing this species under a different name was in press, and so could not be changed. I was, however, able to have the name *distanti* substituted before the publication of my paper. (C. S. BANKS.)

SCADRA Stål.

Öfv. Vet-Ak. Forh. (1859) 176 and 182.
Type: *S. lanius* Stål.

Scadra illuminata sp. nov.

Head, pronotum and sternum shining black; eyes testaceous; pronotum with the lateral margins of the posterior lobe and a central basal longitudinal spot pale ochraceous; scutellum black, the two spinous apical angulations connected with raised marginal carinæ, pale ochraceous; hemelytra dull black, extreme base of clavus, costal margin of corium (not extending to apical angle), connexivum and abdomen beneath pale ochraceous, the latter with four transverse segmental spots on each lateral area and the anal segment, black; rostrum and intermediate legs (remaining legs mutilated in type) black; rostrum with the first joint about as long as remaining joints together; pronotum broadly centrally sulcate, the sulcation not reaching the basal margin; scutellum with two apical spinous angulations. (Antennæ mutilated.)

Long. 12 millimeters.

Hab. Philippine Islands; Negros Occidental, Maao (*Charles S. Banks* collector).

Allied to *S. lanius* Stål.

PHEMIUS Stål.

Öfv. Vet-Ak. Förh. (1859) 200.
Type: *P. tibialis* Westw.

Phemius minor sp. nov. (Plate I, fig. 9.)

Uniformly black or piceous; tibiæ and tarsi ochraceous, apices of the latter black; antennæ ochraceous, bases and apices of the joints more or less black; rostrum reddish, basal joint black; anterior lobe of pronotum with two erect tubercles.

Allied to *P. tibialis* Westw., but a smaller species with the connexivum much less and more angularly developed; apices of femora not ochraceous; basal joint of rostrum black, etc.

Long. ♂ and ♀ 21–29 millimeters.

Hab. Philippine Islands; Benguet, Irisan River (*R. C. McGregor* collector).

AGA gen. nov.

Type: **A. albomarginalis** sp. nov.

Body subelongate; head longer than the pronotum, the postocular area longer than the anteocular and behind eyes wider than the anteocular, moderately attenuated toward base; ocelli distinctly elevated; antennæ about as long as the body (excluding membrane), first joint about as long as head and anterior lobe of pronotum; rostrum reaching the anterior coxæ, second joint longer than the first which extends to the eyes; pronotum distinctly, transversely constricted before middle, the anterior lobe convex and broadly, longitudinally sulcate, posterior lobe moderately convex, centrally, foveately depressed, strongly, longitudinally impressed before the lateral angles, posterior lobe about twice as broad as anterior lobe; scutellum triangular, apex obtuse; membrane longly passing the abdominal apex, about half as long again as corium; legs of moderate length, longly, strongly pilose, not nodulose, tibiæ as long as femora and coxæ together; abdomen with the fourth and fifth segments not dilated.

Allied to *Stachyomerus* by the pilose legs, but differing in the absence of the femoral spines; the shorter and pilose legs, etc., separate it from *Lamprosphodrus;* from *Pœcilosphodrus* it is to be distinguished by the longer head, etc.

Aga albomarginalis sp. nov. (Plate 1, fig. 5, *a*.)

Head, anterior lobe of pronotum, rostrum, sternum and legs castaneous brown; posterior lobe of pronotum, scutellum, corium, membrane and abdomen beneath pale ochraceous; anterior margins of anterior and posterior pronotal lobes, basal margin of scutellum connected with a transverse fascia crossing base of corium, and strong lateral suffusions to sternum tomentosely white; abdomen beneath finely, somewhat longly pilose; legs longly, coarsely pilose; structural characters as in generic diagnosis.

Long. incl. membrane 13 millimeters, Exp. post. pronot. angl. 3 millimeters.

Hab. Philippine Islands; Negros Occidental, Mailum, Bago (*Charles S. Banks* collector).

PHORTICUS Stål.

Rio Jan. Hem. (1858) **1**, 69.
Type: *P. viduus* Stål.

Phorticus cardui sp. nov. (Plate I, fig. 4.)

Above orange-red; head, a large quadrate spot at each basal angle of the pronotum, scutellum, two somewhat large rotundate spots to corium (one near apex of scutellum, the other near the posterior angle) and the membrane black; apex of scutellum and margins of membrane orange-yellow; body beneath orange-red; head beneath and a spot at each basal angle of the prosternum black; legs and antennæ ochraceous; body and legs pilose; antennæ with the first and second joints incrassate, first joint slightly passing apex of head, second longer than first, attenuate at base; pronotum obscurely, transversely impressed behind middle and near base, the lateral margins from this impression narrowed and rounded to head, and longly pilose; scutellum with a faint central longitudinal ridged line; connexivum exposed from about one-third from base; rostrum about reaching middle of mesosternum.

Long. 6 millimeters.

Hab. Philippine Islands; Manila (*Charles S. Banks* collector).

NABIS Latreille.

Gen. (1807) **3**, 127 (part).
Type: *A. apterus* Fabr.

Nabis latreillei sp. nov.

Head and anterior lobe of pronotum pale brownish ochraceous, posterior pronotal lobe pale ochraceous; scutellum brownish ochraceous, with a spot on each side and the apex pale ochraceous; corium pale ochraceous, clavus, a broad irregular medial fascia just beyond apex of clavus and the apical angular area dark brownish ochraceous; membrane hyline, the basal angle and a transverse fascia near middle dark brownish ochraceous; body beneath, rostrum and legs ochraceous, apices of intermediate and posterior tibiæ more or less pale sanguineous; head with the ante- a little longer than the postocular area, the apex subacutely produced; antennæ finely pilose, first joint shorter than second; rostrum with the first joint a little longer than second, third a little more than half the length of second, first joint shorter than first joint of antennæ, pronotum with the anterior lobe centrally, longitudinally impressed, posterior lobe thickly, finely granulate, lateral margins finely, shortly pilose; membrane considerably passing the abdominal apex.

Long. 9 millimeters.

Hab. Philippine Islands; Rizal, Montalban Gorge (*Charles S. Banks* collector).

Allied to *N. brevilineatus* Scott, from Japan.

Family CAPSIDÆ.

DISPHINCTUS Stål.

Öfv. Vet-Ak. Förh. (1870) 668.
Type: *D. falleni* Stål.

Disphinctus ståli sp. nov. (Plate I, fig. 6.)

Black, or piceous black; anterior collar to pronotum ochraceous; a central longitudinal fascia to posterior pronotal lobe (narrow anteriorly and broadened and ampliated at basal margin), scutellum and abdomen beneath stramineous, the latter with black suffusions, principally a spot on each side behind base and the greater part of the apical area; legs ochraceous, apices of anterior and intermediate femora and the whole of the tibiæ pale castaneous brown, posterior legs black, posterior femora with a central pale ochraceous annulation, tarsi more or less piceous or black; antennæ black, first joint ochraceous at base, second about five times as long as first, remaining joints mutilated in typical specimen; corium piceous black, the cuneus distinctly paler and more brownish, membrane brownish ochraceous.

Long. 9 millimeters.

Hab. Philippine Islands; Bataan, Lamao (*H. Cuzner* collector).

Allied to *D. sahlbergii* Stål.

Disphinctus philippinensis sp. nov.

Above brownish ochraceous; head above, rostrum, pronotal collar, a central narrow longitudinal fascia and narrow posterior angular margins to posterior pronotal lobe, a lateral fascia on each side of scutellum, and cuneous pale ochraceous; a small, obscure, linear reddish spot on disk of corium; membrane obscure semihyaline, the basal area piceous; head beneath, sternum and legs, reddish ochraceous, abdomen beneath dull ochraceous; antennæ with the first joint castaneous, its base ochraceous, second joint black, nearly three times as long as first (remaining joint mutilated in typical specimen); connexivum projecting beyond posterior half of corium, ochraceous but more or less black inwardly. Intermediate and posterior legs mutilated in specimen described.'

Long. 8.5 millimeters.

Hab. Philippine Islands; Rizal, Montalban Gorge (*Charles S. Banks* collector.

Allied to *D. reuteri* Stål.

Suborder HOMOPTERA.

Family FULGORIDÆ.

SCAMANDRA Stål.

Stett. Ent. Zeit. (1863) 24, 232.
Type: *S. rosea* Guér.

Scamandra banksi sp. nov. (Plate I, fig. 8.)

Head and pronotum olivaceous brown, eyes ochraceous; mesonotum castaneous; abdomen above brownish, thickly covered with a white, waxy secretion; body beneath pale chocolate-brown, face and legs dark olivaceous brown; tegmina with a little less than basal half dark olivaceous, remaining area and the extreme base brownish testaceous, the basal olivaceous area with two transverse pale ochraceous fasciæ, the first obliquely directed inward, the second iregular and marking the boundary line of the olivaceous area, the brownish testaceous area containing a number of very obscure, slightly paler spots; wings brownish testaceous, the anal area suffused with a white, waxy secretion, posterior margin from anal margin to commencement of apical area, greyish white, veins and cross-veins on central area olivaceous or greyish, the basal half of upper half of wing olivaceous, outer margin of apical area pale brownish; tubercle at base of upper surface of posterior tibiæ short, obtuse; pronotum and mesonotum more or less finely wrinkled, the first with an obscure fine longitudinal carinate line, the latter centrally, longitudinally sulcate; face with two strong central carinations, the lateral margins also strongly carinate.

Long. excl. tegm. 21 millimeters, Exp. tegm. 73 millimeters.

Hab. Philippine Islands; Mindanao, Camp Keithley (*Mrs. M. S. Clemens* collector).

Allied to *S. saturata* Walk., and *S. lydia* Stål.

NEODICTYOPHARA gen. nov.

Type: **N. nasuta** sp. nov.

General characters of *Dictyophara*. Head in type longly produced; face and clypeus centrally longitudinally carinate; rostrum reaching the intermediate coxæ; pronotum angularly emarginate at base, tricarinate; mesonotum tricarinate, the carinations united near anterior margin; femora shorter than tibiæ, posterior tibiæ (in type) armed with about four spines, the one near base very short; tegmina about three times longer than broad, costal margin somewhat strongly arched at base, moderately narrowed at apex, costal area with transverse veins, subcostal area much broader, near base nearly twice as broad; from end of cell three longitudinal veins, the upper and lower apically bifurcated for about half their length; clavus without a transverse vein, apical area reticulate, preceded by a series of prominent transverse veins; wings of moderate size, the veins bifurcating toward apical area and forming a series of irregularly sized and shaped apical cells.

Neodictyophara nasuta sp. nov. (Plate I, fig. 11, *a*, *b*.)

Head, pronotum, mesonotum, body beneath and legs virescent; abdomen above greyish white; tegmina virescent; wings greyish white; head in front of eyes about twice as long as pronotum and mesonotum together, somewhat strongly, upwardly recurved, its extreme apex subtruncate and piceous, the lateral margins above strongly ridged as are also the lateral margins of the face, central carination to face and clypeus sharply prominent; tegmina transversely veined in costal area, irregularly transversely wrinkled in subcostal area; other structural characters as in generic diagnosis.

In the unique ♀ type the genital apparatus above consists of two long parallel spinous appendages, the apices of which are piceous.

Long. ♀ excl. tegm. 15 millimeters, Exp. tegm. 29 millimeters.

Hab. Philippine Islands; Manila (*Charles S. Banks* collector).

SYRGIS Stål.

Öfv. Vet-Ak. Förh. (1870) 758.

Type: *S. acutus* Walk.

SYRGIS ACUTUS Walk.

Issus acutus Walk., List Hom. (1851) 2, 369.

Syrgis simplex Stål, (part) Öfv. Vet-Ak. Förh. (1870) 759.

Syrgis acutus Melich. (part) Abh. K. K. Zool.-Bot. Ges. Wien. (1906) 308.

SYRGIS SIMPLEX Walk.

Issus simplex Walk., List Hom. Suppl. (1858) 92.

Syrgis simplex Stål, (part) Öfv. Vet-Ak. Förh. (1870) 759.

Syrgis acutus Melich. (part) Abh. K. K. Zool-Bot. Ges. Wien. (1906) 308.

The above two species are quite distinct. In *S: acutus* the anteocular portion of the head is longer than the basal space between the eyes; in *S. simplex* the head only projects a little in front of the eyes and is only about one-third the length of the basal space between the eyes.

Syrgis fasciatus sp. nov. (Plate I, fig. 10.)

Fuscous brown; body beneath and legs a little darker; face castaneous brown, the base narrowly black and with two somewhat ill-defined transverse fasciæ (the first before and the second beyond middle), apical margin before clypeus and the posterior portions of lateral margins, pale ochraceous; tibiæ, tarsi and annulations to femora, piceous; sternum mottled with piceous; tegmina with three irregular transverse piceous fasciæ, the first basal, the second broad and at about middle, its costal half broad and sub-triangular and then continued to clavus by two narrow bifurcations, the third fascia narrow, continuous and subapical, apical margin spotted with piceous; vertex longer than in *S. acutus* Walk., the anteocular portion longer than the basal space between the eyes, vertex and pronotum strongly, centrally, longitudinally carinate; mesonotum more faintly tricarinate; face strongly, centrally, longitudinally carinate.

Long. 7 millimeters.

Hab. Philippine Islands; Manila (*Charles S. Banks* collector).

Allied to *S. acutus* Walk., from which it differs by the longer and more produced vertex and the fasciated face and tegmina.

MINDURA Stål.

Rio Jan. Hem. (1862) **2**, 69.
Type: *M. alligata* Walk.

MINDURA ALLIGATA Walk.

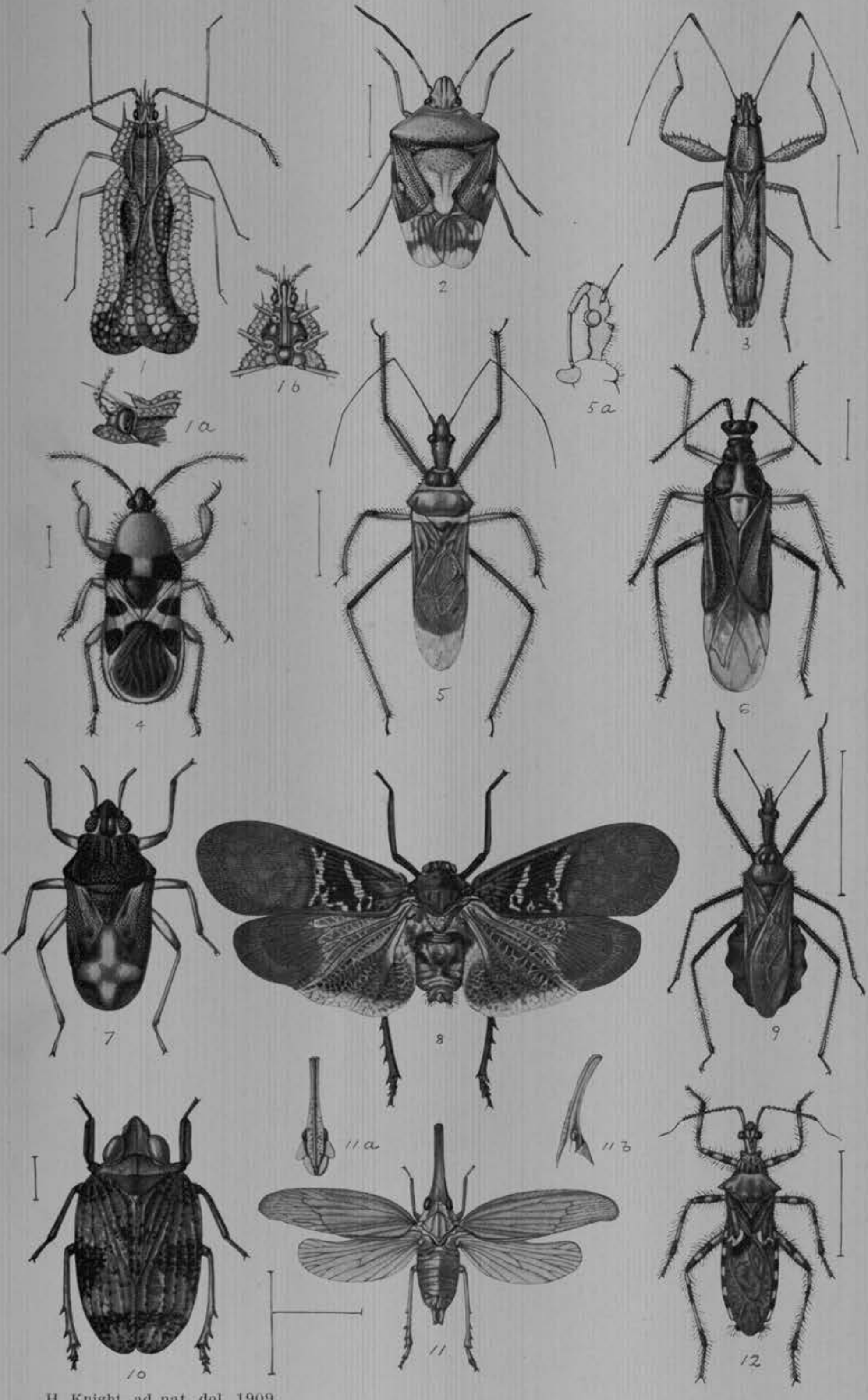
Mogodina alligata Walk., Journ. Linn. Soc. Lond., Zool. (1868) **10**, 170.
Mindura subfasciata Stål, Öfv. Vet-Ak. Förh. (1870) 770; Melich. Mon. Ricaniid. (1898) 302.

Melicher has given Stål's name priority, but he has given 1870 instead of 1868 as the date of Walker's description.

ILLUSTRATIONS.

PLATE I.

FIG. 1, *a*, *b*. Hormisdas pictus Dist., gen. et sp. nov.
2. Pegala clemensæ Dist., sp. nov.
3. Pachygrontha nigrolineata Dist., sp. nov.
4. Phorticus cardui Dist., sp. nov.
5, *a*. Aga albomarginalis Dist., gen. et sp. nov.
6. Disphinctus ståli Dist., sp. nov.
7. Merragata cruciata Dist., sp. nov.
8. Scamandra banksi Dist., sp. nov.
9. Phemius minor Dist., sp. nov.
10. Syrgis fasciatus Dist., sp. nov.
11, *a*, *b*. Neodictyophara nasuta Dist., gen. et sp. nov.
12. Acanthaspis distanti Banks.



H. Knight, ad nat. del. 1909.

PLATE I.

ON THE MYRMECOPHILY OF CATERPILLARS OF CATOCHRYSOPS CNEJUS FABR.

By H. VIEHMEYER.

(*Dresden, Germany.*)

[Translated and edited by Charles S. Banks.]

In a collection of larvæ of Lycænidæ received from Mr. W. Schultze, of the Bureau of Science, Manila, P. I., I have noted, among other interesting forms, the species designated in the title of this paper.

The larvæ belong to those species which bear a symbiotic relationship to ants. De Nicéville [1] thus designates them and in doing so says, "Extensile organs on the twelfth segment small." He mentions *Camponotus rubripes* Drury, subspecies *compressus* Fabr. (det. Forel.) as visiting ants. In the same work he gives the following notes by Green, of Ceylon: "Both species (*Tarucus theophrastus* Fabr. and *Catochrysops cnejus* Fabr.) have the power of emitting some agreeable odor or juice from the small movable horns situated on the upper side near the tail. These horns are capable of being projected and retracted at pleasure." What De Nicéville here says regarding the peculiar organs of the larvæ of *C. cnejus* is very incomplete and is therefore liable to give a false impression.

The ant-attracting organs of the lycænid larvæ were first fully described and figured by Brants [2] (1865) and Gueneé [3] (1867), apparently independently of each other. According to them, these larvæ possess two distinct organs: The first on the dorsal surface of the third from the last abdominal segment (the eleventh body-segment, including the head), on the median line and near the posterior margin of the segment having the form of a straight sulcus surrounded by two swellings or lips; upon the penultimate (twelfth body-segment) toward the outer half and behind the last pair of stigmata is another pair of eversible (evaginating) and inversible (invaginating) cylinders, the upper edges

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[1] The Butterflies of India, Burmah and Ceylon (1890), 3, 17.

[2] Sepp. Jan. Christian, Nederlandsche Insekten (1870), (2) pt. 2, 59, *pl. 13*.

[3] D'un Organe particulier que présente une chenille de Lycæna. *Ann. Soc. Ent. Fr.* (1867), (4) 7, 665–668, *pl. 13, figs. 9–12*.

of which are provided with a crown of short, hair-like bristles. Edwards[4] discovered on the caterpillars of *Lycæna pseudargiolus* Boisd., that the slit-like pores gave forth a drop of liquid which was quickly licked up by the ants and positively carried off and that the tubes upon the twelfth segment neither voided a drop of liquid nor did the ants pay any attention to them.

In spite of the exceedingly clear and detailed description and differentiation of the organs as given by Edwards, later observers have repeatedly put forth the assertion that only one of the two pairs is functional or that the ants lick the evaginating tubes. Both these latter statements are certainly false in so far as they apply to the larvæ before the second moult. Moreover, the caterpillars of *C. cnejus* show clearly the fluid-producing pore upon the third from the last segment, if De Nicéville does not err. I do not doubt but that when more careful research is made the pore will be found upon all larvæ in which De Nicéville has indicated only tubes.

For *C. pandava* Horsf. and *Polyommatus bœticus* Linn., at least, I am able to demonstrate both organs. Apparently the only exception seems to be *Curetis thetis* Dru., but according to De Nicéville they appear not to be visited by ants, and their tubes are to be differentiated from those of the myrmecophilous lycænid caterpillars as well by their form as by their habits. It is therefore equally as possible that we have to deal in this case with a substantially different organ.

The more important of the two organs are the secreting pores, for they furnish the attraction for the ants; but what the relationship of the tubes is appears still uncertain. One might consider them as defensive weapons or at least as the rudiments of such, as signal tubes, or as scent organs for attracting the ants. A partial explanation of their relationship is given by the earlier stages of the caterpillars of *C. cnejus*. It should be noted that the development of both organs is not symmetrical, but that they are drawn toward each other. Edwards appears to have studied the earlier stages of these caterpillars in order to determine the existence of the myrmecophilous organs. He says, "The outward openings (the tubes) and the orifice in [segment] 11 are visible in the youngest larval stages, but till near maturity the larva has no use for the tubes and can not emit the secretion."

In the caterpillars of *C. cnejus* the relationship is different. At the time of leaving the egg it possesses neither pore nor tubes. After the first moult the pore appears; after the second, the tubes. This agrees perfectly with the observations of Scudder[5] on the caterpillars of *Everes*

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[4] On the Larvæ of Lycæna Pseudargiolus and Attendant Ants. *Can. Ent.* (1878), **10**, 131–136.

[5] The Butterflies of the Eastern United States and Canada. (1882), **2**, 914 and 959.

comyntas Godt. He disposes of the question of the presence of evaginating tubes, or "caruncles" as he calls them in parentheses, by, "First noticed in the third stage." Indeed, of the caterpillars of the genus *Rusticus* Hübn., he then says, "A transverse slit in the middle of the dorsum of the seventh abdominal segment appears in the third stage, but apparently the caruncles of the eighth segment do not appear until the fourth stage."

From the extraordinary similarity of the caterpillars and the almost perfect similarity of structure of the myrmecophilous organs, I do not believe that such a striking difference could exist, but rather think that an error lies therein. Another question here arises, and that is as to whether the organs, as Edwards questioned, are really functional in the earlier stages of the caterpillar's existence.

I have recently noticed that Gillmer[6] also affirms that in caterpillars of *Lycæna argyrognomon* Bergstr., the pore is developed first in the second stage and the tubes first in the third stage. It is then certain that the earlier statements concerning this are not exact.

Finally, the first stages of the caterpillar of *C. cnejus* must be considered from another standpoint. Thomann[7] has made certain careful studies upon the integument of the caterpillars of myrmecophilous Lycænidæ. He found that the skin is covered with "star-shaped warts so exceedingly small that they can not be seen by the naked eye and that from their centers grows a single minute bristle with, usually, a tuft of fine hairs at its tip." He sees in these growths possible organs of touch, which may serve to notify the caterpillars of the return of the ants.

This view appears to be reasonable, especially as in the region of the myrmecophilous organs there is usually to be found an accumulation of these tufted hairs. In the young caterpillars of *C. cnejus* there are three interesting facts to be noted: That the tufted hairs appear after the first moult simultaneously with the opening of the pore; in this stage they remain proportionately sparse and appear especially around the pore, but not in masses; after the second moult, they show in the same numbers and with the same arrangement as in the fully developed larvæ.

The ant which visits this caterpillar is *Polyrhachis dives* Smith (det. Forel.) Green's supposition that the pupation of the caterpillar takes place in the ant's nest appears to be without foundation. The appearance of caterpillars of Lycænidæ in ants' nests seems to me, at least for the European species, to be more or less accidental and then only if the ants' nests are upon the ground in the immediate vicinity of the food plant of the caterpillar.

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[6] Ein literarischer Beitrag zur Grosschmetterlingsfauna von Lübeck. *Arch. d. Ver. d. Naturgesch. in Meck.* (1907), 61.

[7] Schmetterlinge und Ameisen. (1901).

LIST OF THE MYRMECOPHILOUS LYCÆNIDÆ OF THE INDO-AUSTRALIAN REGION.

Gerydus symethus Cramer.
Cyaniris puspa Horsf.
Lycæna astrarche Bergstr.
Lycæna icarus Rotb.
Lycæna hylas W. V.
Zizera lysimon Hübn.
Azanus ubaldus Cram.
Chilades laius Cram.
Chilades trochilus Freyer.
Lycænesthes emolus Godart.
Lampides celeno Cram. (ælianus Fabr.)
Catochrysops pandava Horsf.
Catochrysops cnejus Fabr.
Tarucus theophrastus Fabr.
Castalius ananda deNicév.
Polyommatus bœticus Linn.
Liphyra brassolis Westw.[8]
Hypolycæna phorbas Fabr.
Arhopala meander Boisd.
Aphnæus vulcanus Fabr.
Rapala schistacea Moore.
Ogyris genoveva Hewits.
Jalmenus evagoras Don.
Jalmenus ictinus Hewits.

[8] Doubtfully myrmecophilous, at least in the sense here indicated.

A MYRMECOPHILOUS LYCÆNID CHRYSALIS FROM THE PHILIPPINES.

By H. VIEHMEYER.

(*Dresden, Germany.*)

[Translated by W. Schultze.]

At the beginning of the year 1908, Mr. W. Schultze, of Manila, sent me a very interesting lepidopterous chrysalis, together with some ants, for which I here wish to express by thanks. Concerning the locality the following information is taken from his letter:

> "One of my friends (Mr. H. M. Curran) had a large, old tree in Santa Maria, Laguna Province, cut down in order to obtain certain epiphytic plants. As the tree lay on the ground, he observed that ants had built an earthen nest among the roots of one of the epiphytes, and that the nest had been broken by the fall of the tree. His interest was further aroused when he noticed that the furious ants had grouped themselves around certain objects within special cells fastened to the bark of the tree as if to defend these objects.His astonishment was great when he found that the immovable objects were lepidopterous chrysalids. He counted about sixteen specimens. In using a forceps for their extraction from the nest he crushed three, after which he succeeded in loosening six more with his hands. These he placed in a glass bottle and brought them, four days later, to the laboratory."

So much for the facts. Unfortunately, no butterflies emerged from the chrysalids, although they were in an advanced stage of development.

We are in all probability dealing with a species of the genus *Arhopala*. The ants were *Camponotus quadrisectus* Smith (det. Forel). First of all, so far as the particular nest design of *Camponotus* is concerned, one is strikingly reminded of the hanging nests or "ant gardens" which E. Ule observed in the Amazon region.[1] In our case, what he says about *Camponotus femoratus* Fabr., would appear to best apply to the question namely:[2]

> "The nests of these ants are often built high up in the trees, though they are found just as abundant in shrubs more or less close to the ground. The primary

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[1] Ameisengärten im Amazonengebiet. *In Engler's bot. Jahrb.* (1902), **30**, No. 68, 45–52.

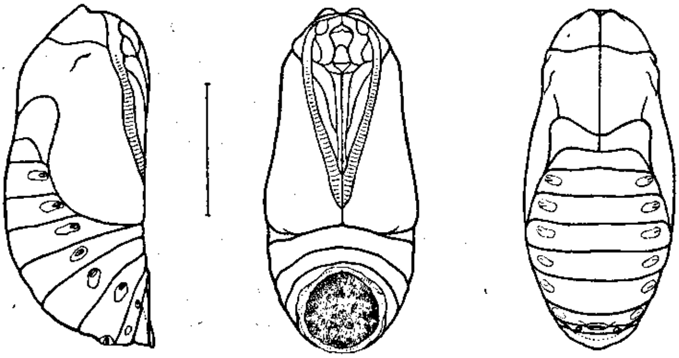
[2] Blumengärten der Ameisen am Amazonenstrome. In Karsten u. Schenck, Vegetationsbilder, 3te Reihe, Heft I, Taf. 1–6.

foundations of these nests consist for the most part of very small, irregular accumulations of earth. The whole structure rarely attains the size of a man's head and is surrounded by a somewhat thin, earthy, crust-like cover. Inside it consists of numerous irregular chambers having no particular design. Plants soon begin to grow over the entire surface of the nest from seeds previously carried in by the ants. Some of these plants attain a considerable size. Still more earth is now carried in by the ants so that the plants do not lack material for nutrition and can develop into enormous clusters. Since in this manner the ants often cultivate flowering plants, their nests may be called 'flower gardens of ants' in analogy with Müller's 'fungus gardens.' As these plants, thus bred by the ants, are, by reason of their care, able to live in the air in the same manner as epiphytes on other plants, I shall call them 'ant-epiphytes.'"

In this comparison too much importance should not be attributed to the fact that the plant was probably a true epiphyte and received no direct benefit from the accumulation of earth by the ants. The relationship between the plants and the ants here existing is not symbiotic in the strictest sense, because it directly benefits only the ants, in that the interlacing of the plant roots increases the stability of the nests. The benefit which the plants receive from this relationship is a very equivocal and incidental one. As a rule, one does not speak of benefit, but rather of injury, so long at least as it is not proved that the ants make selections among plant species. It is therefore not difficult to imagine similar conditions in the case of *Camponotus quadrisectus* Smith; on the other hand, it is also easily possible that the ants take possession of the interlacing roots simply as a suitable place for their nest. I simply wish to indicate here the probability of the first-mentioned association, in order to call attention to these relations, further observations upon the construction of the nests of *C. quadrisectus* being needed in order to show which of the two possibilities applies to the case in question.

The relation of the ants to the lycænid chrysalids is, however, clearer and more interesting. The pupa sent to me is about 17 millimeters long and shows the closest similarity to the dominant forms in the genus *Arhopala*. The abdominal extremity is developed into a large cupule or pulvillus-like depression, presumably similar to that of many of its closely related allies, at present unknown, and by means of which it was fastened to the bark of the tree within the ants' nest. Dorsally, on the seventh abdominal segment, exactly in the place where the myrmecophilous lycænid larvæ have the opening of the secretary gland, there is situated an oval, chitinous, crater-shaped cavity 1.3 millimeter in length and 0.7 millimeter in width. Its edges consist of strong, dark-colored chitin and project considerably above the surrounding surface. Inside the oval zone the chitin is much thinner and readily distinguishable by its yellowish color, though especially so when viewed by transmitted light. When the butterfly is withdrawn from the skin of the pupa, one notices plainly that a fine transverse incision is present between two chitinous lamellæ, which extend into the crater from the cephalic and caudal borders, respectively. A direct connection is thus indicated as existing between the interior of the body of the pupa and the chitinous crater.

It is a great pity that the pupa sent to me was not suitable for sectioning. From the striking size of the chitinous crater and the connection with the inside of the pupa, we may conclude with comparative safety that secretory glands are also present. This pupa must therefore be considered myrmecophilous, and certainly, as such, of a species which actually supplies the ants with some kind of secretion. It is an ascertained fact that the pupæ of myrmecophilous Lycænidæ are often found in ant nests. So far as all the palearctic species are concerned, the presence of lepidopterous pupæ in colonies of ants is not usual, but more or less accidental. At the time of pupation, when the caterpillars leave the food plant, they very often wander into the immediate vicinity or even into the nests of ants which frequently have their colonies located at the roots of the plant. That the pupæ are permitted in the nests of ants is easy to understand on the basis of the symbiotic relationship existing between the caterpillar and the ants. The ants experience the transformation of the caterpillar into the pupa in their very midst, as it were. Very probably their toleration of the pupa is enhanced by the existence of some pleasantly scented substance, secreted by glandular cells situated in its epidermis; at least the action of the ants seems to point in that direction. In none of the lycænid pupæ hitherto known to me is the reason for this tolerance to be sought in the presentation of some kind of gift by the pupa to the ants, because all pupæ of this family so far known are without a secretory organ.



FIGS. 1, 2, 3.—LATERAL, VENTRAL AND DORSAL ASPECTS.

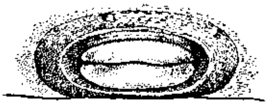


FIG. 4.—MYRMECOPHILOUS ORGAN.

The possession of the organ used in serving the symbiotic relationship appears very strange, in view of the profound histolytic and histogenetic processes during the pupal stage. One might be induced to consider the organ as rudimentary, in a manner similar to the abdominal feet of some caterpillars, indications of which are still visible upon the pupa. A comparison of pupa and caterpillar should then show the development of the secretory organ in the former to be much less than in the latter. The caterpillar producing this pupa is still unknown. A short time ago I received from India caterpillars and pupæ of *Arhopala amantes* Hewits., which show similar relationship when compared from this point of view. The pupæ of this latter species are larger than that under discussion and have also a myrmecophilous organ, though not nearly as well developed. In a comparison between pupa and caterpillar of *A. amantes,* with reference to their myrmecophilous organ it becomes apparent that externally they are exactly alike. As the pupa from the Philippines is much smaller than that from India, though having a much larger and more strongly developed chitinous crater, it can not possibly be assumed that this organ is rudimentary, but it must be considered as being completely functional. This would therefore indicate that the living together of this pupa and the ants is no longer accidental, but has become an obligatory relationship.

The myrmecophilous lycænid caterpillars, as is well known, have, besides the glands for producing honeydew, another organ which has a relation to the symbiosis. On the eighth or penultimate abdominal segment there are two tubes provided with a bristly rim which can be drawn in or extruded like a pair of snail tentacles. In all probability these two epidermal tubes strengthen the symbiosis by attracting ants through the secretion of a scent substance. By no means do the tubes produce any kind of liquid secretion. It is therefore very worthy of note that the tubes in the pupa from the Philippines are entirely rudimentary. They appear only as a pair of slight depressions in the chitin. In concluding that the epidermal tubes are scent organs for attracting ants, it is at once apparent why the tubes and not the secretory organs have become rudimentary in the pupal stage. The attracting of the ants and, therewith, the functioning of the organs serving that purpose, naturally become unnecessary in the ant nest, while the organs which serve in the real symbiosis retain their significance and utility.

To sum up: We have here undoubtedly the peculiar spectacle of a lepidopterous pupa acting as a food purveyor to ants, as it gives them, from a chitinous crater, the secretion of two glands (in analogy with the caterpillars) at least during the first part of the pupal stage.

This singular occurrence induced me first of all again to make a thorough investigation of all lycænid pupæ obtainable. But on none could I discover myrmecophilous organs, and the symbiosis of the Philippine pupæ with *C. quadrisectus* would therefore have become a very interesting but doubtful case had I not received the aforementioned material from Mr. T. R. Bell, of Karwar, India. The pupæ of *A. amantes* represent, so to speak, the missing link between those lycænid pupæ which are simply permitted to remain, or are more or less accidentally found, in ant nests and those which we may legitimately assign as dwelling in ant colonies.

It would be very interesting to search further for the reciprocal relationship of the symbionts on the spot, chiefly to find out if the butterflies when emerging are not possibly in need of assistance from the ants, as well as to verify the secretion by actual observation. In this wise it would be easier to understand the symbiotic relationship than if the retention of the honeydew glands were credited merely to their use in repaying the ants for the protection afforded the pupæ. For the latter reason no secretory organs such as are demonstrable in many examples, would be needed. As Thomann has demonstrated, the pupæ of palearctic Lycænidæ do not need the help of the ants. This I have been able also to verify on a number of species.

THE POLYSCOPIC CELL. A NEW MICROSCOPICAL ACCESSORY.

By Charles S. Banks.

(From the Entomological Section, Biological Laboratory, Bureau of Science, Manila, P. I.)

For many years I have found myself handicapped in the study of the anatomy of microscopic animals, especially insects, by having no means whereby parts might be mounted either temporarily or permanently in such manner as to obviate their distortion and at the same time to enable the observer to view them from all sides. Those who have had to study mouth parts, thoracic sclerites and genitalia of minute Coleoptera, Hymenoptera, Lepidoptera and Diptera, will appreciate what I mean when I say that it is next to impossible to get, for example, the proper relationships of the parts of male genitalia in Culicidae in preparations mounted according to the ordinary *modus operandi.*

One needs but to take up any of the more recent publications dealing with mosquitoes in which photomicrographs of the genitalia appear, to be struck immediately by the very unsatisfactory appearance of most of these, owing to displacement of parts, due to pressure of the cover glass in making the preparations.

Furthermore, everyone who has observed the genitalia in living mosquitoes and those recently dead knows that the parts lie in many planes and that no satisfactory idea of their relationships can be secured from a slide which gives only a ventral or a dorsal aspect. It is true that by using a "built-up" cell, this distortion of parts may, to a certain extent, be overcome, but at best it is exceedingly difficult so to mount one of these preparations by ordinary methods as to get a lateral view; and then, if one should succeed in thus mounting the specimen, he must either prepare a second mount showing the dorsal surface and a third one showing the ventral surface, or else reverse the slide, which is not always feasible because of its thickness or of the position of the cover glass.

After having tried every one of the classical cells, as well as numerous others devised by myself, I have at last, I believe, secured a cell which will prove useful not only to the entomologist but likewise to the general biologist.

As the name would suggest, this cell enables the worker to observe all sides of an object parallel to its longitudinal axis, provided this corresponds with the longitudinal axis of the cell itself. For example, in a preparation of the male genitalia of any species of mosquito, if the last three abdominal segments be mounted in this cell, one may obtain both lateral, ventral and dorsal aspects. The only aspect not possible would be the caudal, and this, for anatomical purposes, is quite unnecessary, as all essential features are demonstrable in the other four.

The polyscopic cell, which is really nothing more than a section of glass tubing of small caliber, is made by grinding it to the form of a square prism instead of a cylinder. This, as I shall describe in detail, is easily accomplished in any institution having a rock grinding apparatus; and three or four dozen of these cells can be prepared in a day by the plan which I have adopted.

METHOD OF PREPARATION.

Lengths of glass tubing of small diameter, say 4 to 6 millimeters, and of the required caliber, are cut up into pieces of the desired length, usually 15 to 20 millimeters. It would be better to keep pieces cut from the same tubing together, as these are most likely to have the same caliber and the cells will be kept uniform in this way. Nine to a dozen of these short tubes are fastened to a small plate of glass such as is used in grinding rock specimens.

The best preparation for cementing to the glass is a mixture composed of 20 parts of white shellac and 7 parts Canada balsam. This, in the form of a pencil, is applied to the glass plate held over the gas flame, until a sufficient quantity has melted upon the plate. The short tubes are then placed close together and pressed down upon the plate so that they will all be parallel. (See Plate I, fig. 2.) The cement having become hard, the tubes are ground down upon the steel wheel of a rock-grinding machine, the operator employing first coarse emery and then finer until their surfaces have become worn to the desired degree and have the velvety appearance of ground glass. A still finer polish may be obtained by next grinding for a short time on a plate glass with pumice and water. (See Plate I, fig. 3.)

The next step is to dry the plate and gently heat it until the tubes become loose enough for removal. The entire mass of adherent tubes may be slipped off, turned completely over, pressed firmly to the glass plate to remove air bubbles and, after cooling, the operation of grinding the faces on the opposite side begun. (Plate I, fig. 4.) This being completed, the tubes are now removed as before, set up on edge so that their plane faces are contiguous, recemented to the plate and the third face ground. (Plate I, fig. 5.) For the fourth face, the mass may be slipped off entire and turned over, the same precautions being taken to press the mass flat to the plate. (Plate I, fig. 6.) The finished cells will then appear as in Plate I, fig. 7.

The cells may now be removed from the plate and, after cleaning off the cement, they are ready for use. They may, however, be polished even more finely if it is so desired, to remove the ground surface and render them perfectly transparent like ordinary glass slides; but this is not absolutely necessary, for the following reasons: After mounting the specimen, the only thing necessary when it is desired to study it under the microscope is to place a drop of immersion oil on the top of the cell and press over it a tiny piece of cover glass. This causes a perfect transparence of the top of the cell and makes the inclosed specimen visible. The only special advantage of having the cell polished is to enable one to determine quickly the position of the specimen within. An advantage of leaving the cell with ground sides is that the number and name of the specimen may be written easily upon the surface with India ink.

METHOD OF USE.

The slide once made (Plate I, fig. 8), the method of preparing and mounting the specimen is a very simple one. Having passed it through all the fluids to the xylene, the portion of the insect which it is desired to preserve is dissected away and placed in the tube of the cell which has previously been filled with Canada balsam dissolved in xylene. The specimen, which should be just large enough to slip into the tube readily, is pushed in by means of a pin or other suitable instrument and the ends of the tube sealed with slide cement of the kind generally used by the worker.

Sometimes it may occur that the specimen is slightly smaller than the caliber of the tube and, in order to hold it in a fixed position therein, recourse may be had to a bent bristle which is pushed in until it comes in contact with the specimen. (Plate I, fig. 9.) A tiny piece of filter paper or other convenient substance will serve the same purpose, as shown in the figure indicated.

Cells of the kind described here may be stored as easily as ordinary microscopical slides by either placing them in a drawer with compartments numbered to correspond with their numbers or else in small envelopes. Where slide cabinets with compartments of sufficient depth are available, an excellent plan is to fasten each cell to an ordinary slide by means of a minute drop of balsam which, while retaining it in place for storage, may be dissolved easily when it is necessary to work with the specimen.

CELL HOLDER.

When using the preparation for study, the cell may be held in place upon a special holder which I have devised for this purpose. It consists of an aluminium plate 25 by 75 millimeters, having an opening 10 by 30 millimeters, in which a small glass slide may rest upon a flange and upon which the cell may be placed and clamped as shown on Plate II, figs. 1 and 2. This piece of apparatus is not necessary if one has slide clips on his microscope long enough to rest upon the ends of the cell, and thus retain it in position for work with the camera lucida or in making photomicrographs.

USES OF THE CELL.

This cell will be found useful not only for minute insects and parts of insects, but it can also be employed to great advantage in the study of Crustacea, Arachnida, Infusoria, Rhizopoda, Vermes, etc. In reality, there is no minimum limit to the size of the cell provided one can obtain glass tubes of small bore. I have cells which have a caliber of less than 0.45 millimeter, and an outside diameter of less than 1 millimeter, thus obtaining a distance of less than 0.625 millimeter between the lower surface of the "Zeiss DD" lens and the floor of the cell tube. The distance between the upper surface of an object lying in a cell of this size and the lens would be small enough to make it possible to examine the object with ease, using a high-power lens.

However, it must be borne in mind that the greater utility of this cell will be in connection with lower power lenses and the camera lucida or the photomicrographic apparatus, and that it serves primarily as a means of preserving parts undistorted by pressure, such as is inevitable in the ordinary technique of flat slide and cover glass, and enables the worker to see successively four sides of the specimen.

ILLUSTRATIONS.

PLATE I.

FIG. 1. Glass cell cemented to plate and ready for grinding.
FIGS. 2–7. Successive positions in grinding a number of the polyscopic cells.
FIG. 8. The finished polyscopic cell ready for the specimen.
9. The cell with specimen mounted showing means of holding the object in place therein; ready for microscopical examination.

PLATE II.

FIGS. 1 and 2. Slide devised by the author for holding the cell when microscope is inclined.
FIG. 3. Photomicrograph of ♂ genitalia of *Culex fatigans* Wied., mounted in polyscopic cell, using Zeiss AA objective and No. 3 ocular.
4. Lateral view of same mount, the cell having been given a quarter turn.

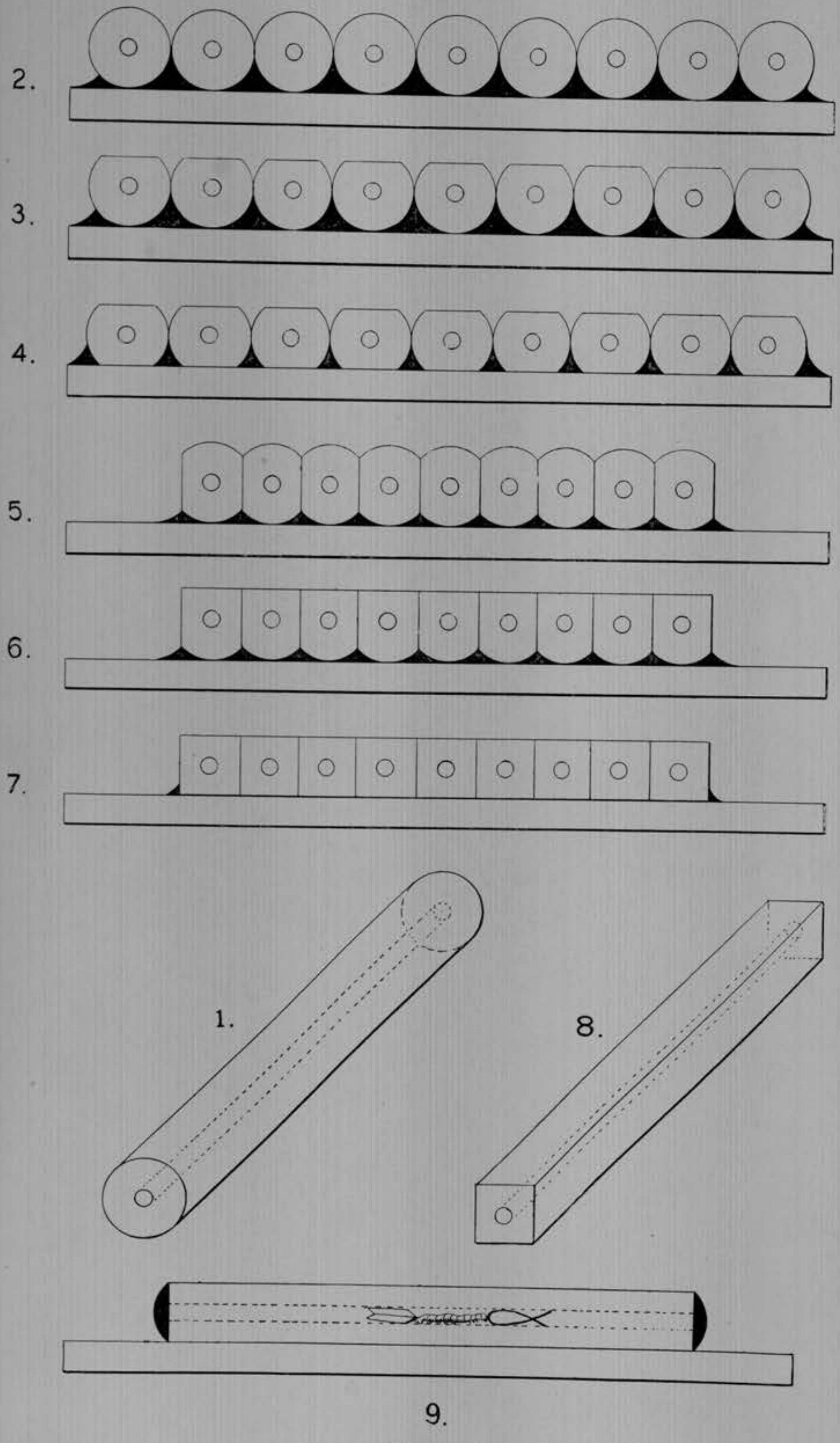
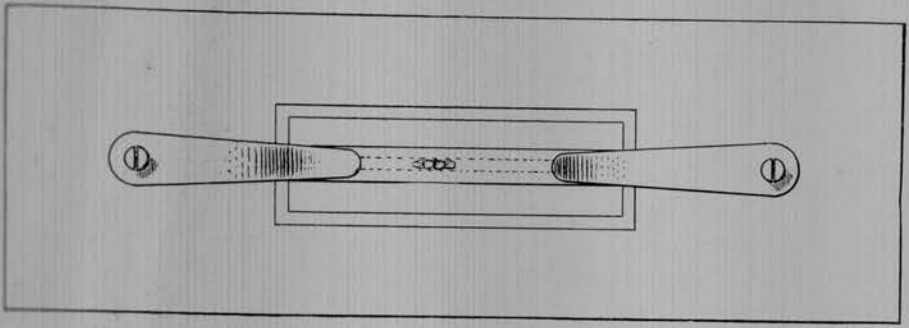


PLATE I.



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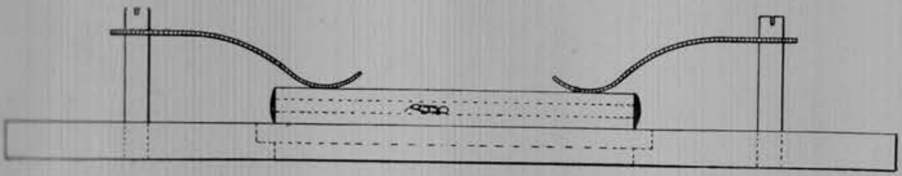

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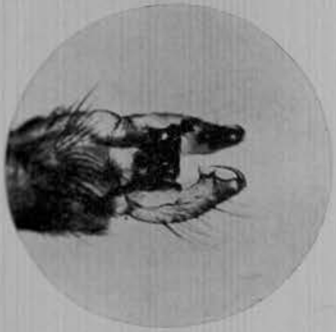

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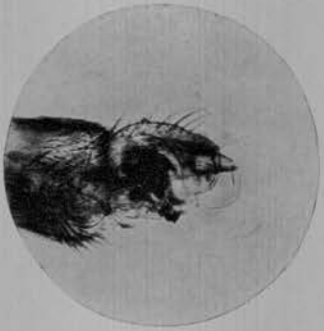

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PLATE II.

EDITORIAL.

AN INTERESTING OCCURRENCE WITH STICKY GRASS: ERAGROSTIS VISCOSA TRIN.

While sitting on the veranda at my home several days ago, my attention was attracted by the pitiful wailing peep of a small chicken. I thought at first that it was simply lost and was crying for its mother, but as the wail continued unremittingly for about half an hour, I sent my boy out to find the chick. He returned in a moment bringing a two-day old chicken, still peeping. Upon glancing at it I discovered that three flower stalks of sticky grass were firmly attached to its neck, and two more were twisted in the downy feathers under one wing, the boy in releasing the chick having pulled up the grass.

It required considerable manipulation to disentangle the down of the chick from the grass, but it is quite certain that it could never have freed itself had not help come as it did. In running along, the chick had evidently become enmeshed by a couple of the grass stalks and then, in its efforts to get free, had involved itself to a more serious extent.

An examination of the grass shows that when it is in flower and fruit there exudes from a series of longitudinal pores, beginning from 5 to 10 millimeters below the panicle and extending downward for 10 to 15 millimeters, a viscid substance of great tenacity. This substance serves the plant primarily for protection against ants and other insects which might climb the stalk and damage or remove the flowers or unripe seeds.

As *Eragrostis viscosa* Trin. is very widely distributed in the Philippines as well as in other parts of the Tropics, the possibility of its doing greater damage than would have occurred in this single instance makes its eradication, especially in chicken yards or in other places to which young chickens have access, a problem worthy of consideration.

CHARLES S. BANKS.

A METHOD OF USING MAGNESIUM SULPHATE FOR THE ANÆSTHETIZATION OF MARINE ANIMALS.

While on a collecting trip in the Philippine Islands this spring, I used a method of anæsthetizing marine forms with magnesium sulphate which proved very successful. The method may not be new to many workers, certainly the principle is not. Since I do not know of any zoölogist who uses magnesium sulphate in just this way, I venture to publish the method and hope some one else may find it useful. Success in using magnesium sulphate lies in securing its quick diffusion through the water in sufficient quantity, without causing any mechanical disturbance of the animals to be anæsthetized. If a heap of crystals of the salt is placed on the bottom at one side of a dish of water, solution and diffusion are very slow, and attempts to hasten these processes are apt to result in the contraction of sensitive forms. Some workers have made a large quantity of a saturated solution of the salt, which was then led through a tube to the surface of the dish in which were the animals to be stupefied. I believe this method gives good results; but it is a difficult one to use in ordinary field collecting, where room and apparatus are limited.

The forms on which I have been working this year have been mostly corals, alcyonaria, and gorgonians, with some hydroids and worms. Most of these are quite sensitive. Many of the gorgonians are very slow to expand after they are brought in, and are extremely ready to contract at any time; and I have failed completely in securing well-expanded specimens by the first method mentioned.

The method which I have used successfully is as follows:

> A considerable quantity of the magnesium sulphate, say 50 to 250 grams, is tied in a piece of cheese cloth and hung over a dish of water so that the bottom of the bag barely dips into the water. It does not seem to matter whether the bag is directly over or to one side of the specimen to be anæsthetized. Streams of the sulphate solution can be seen descending at once through the water in the dish. Even extremely sensitive zoöids do not seem to be disturbed by the streams of the salt solution. I have sometimes used two bags of the sulphate when a considerable number of specimens were in one large dish. In order to preserve some of the larger specimens, I have anæsthetized them in dishes holding 6 gallons of water. Anæsthesia of some of the alcyonaria can be completed in fifteen minutes, and of most gorgonians in half an hour.

On this same trip I used successfully A. G. Mayer's method of anæsthetizing medusæ by carbon dioxide. The charged water is also helpful in the case of some alcyonarians and gorgonians, although it must be used in conjunction with magnesium sulphate. To other related forms the carbon dioxide is an irritant.

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